

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

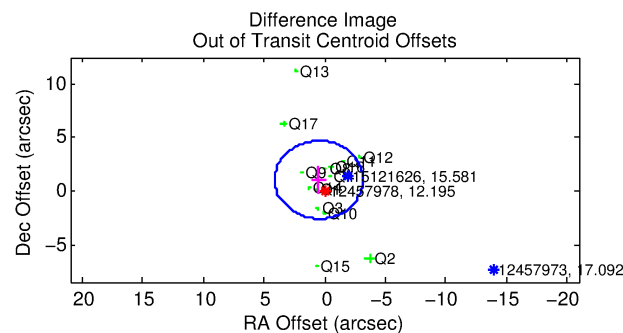
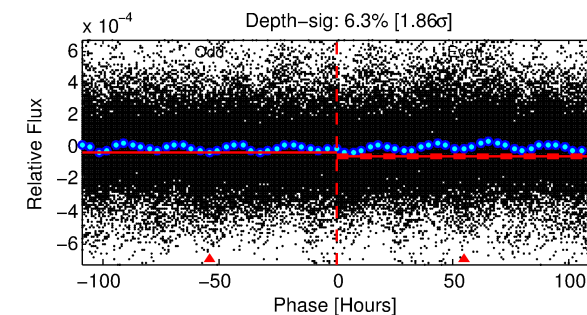
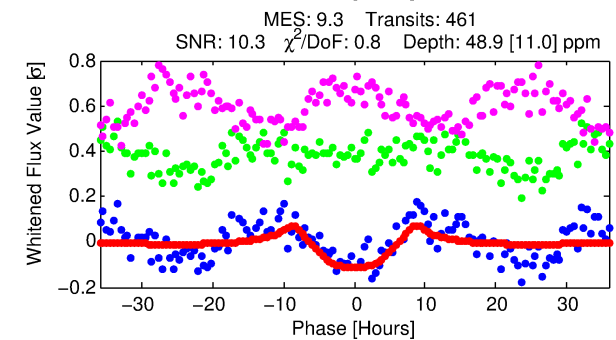
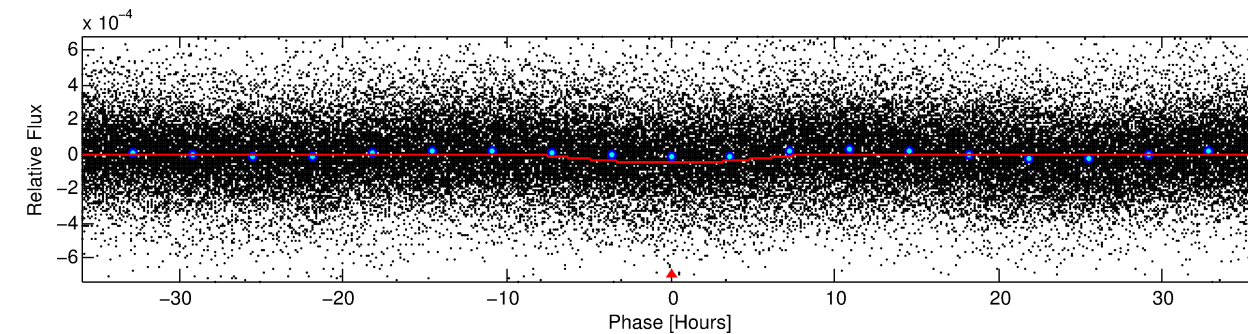
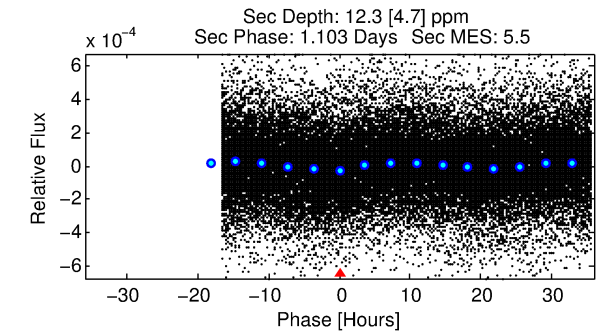
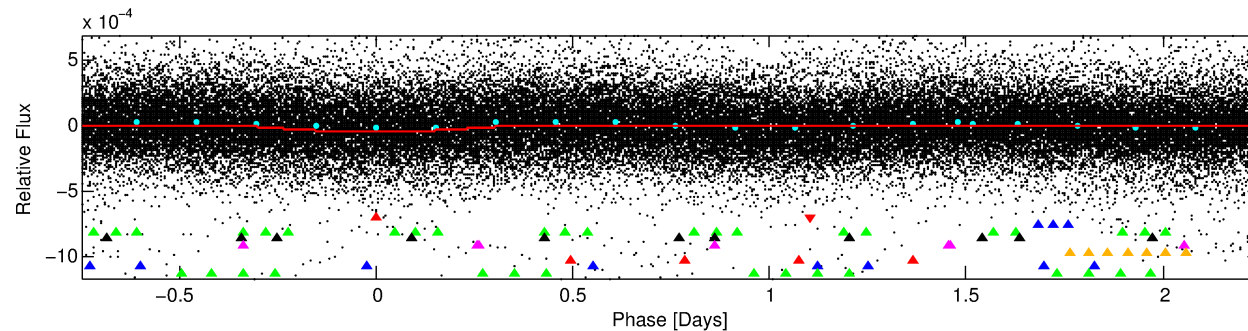
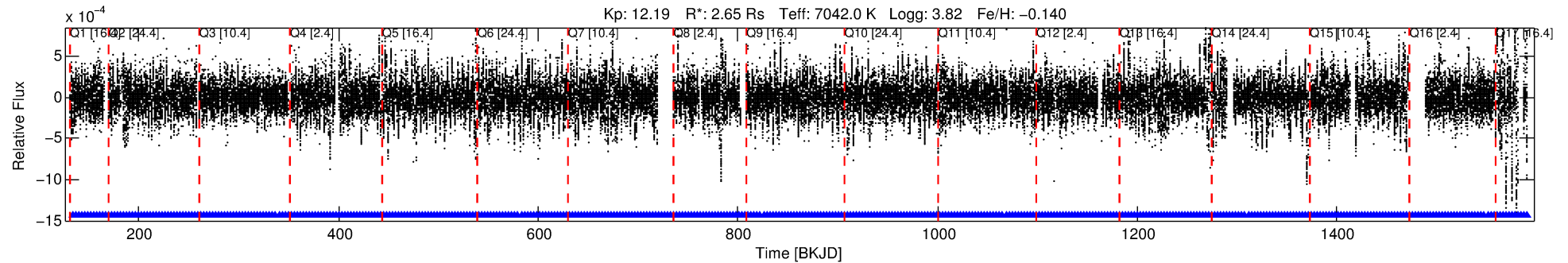
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-01

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 1 of 9 Period: 2.996 d



DV Fit Results:

Period = 2.99613 [0.00009] d
Epoch = 133.6778 [0.0234] BKJD
Rp/R* = 0.0094 [0.0018]
a/R* = 1.02 [0.00]
b = 0.99 [0.00]
Seff = 6566.20 [3415.86]
Teq = 2295 [299] K
Rp = 2.73 [1.12] Re
a = 0.0486 [0.0159] AU
Ag = 2.14 [1.56] [0.73σ]
Teffp = 4293 [590] K [3.02σ]

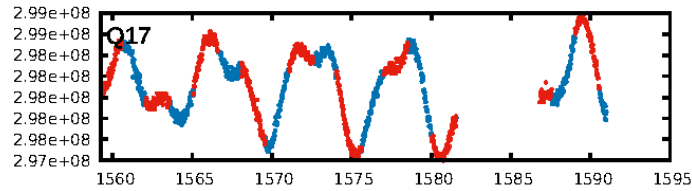
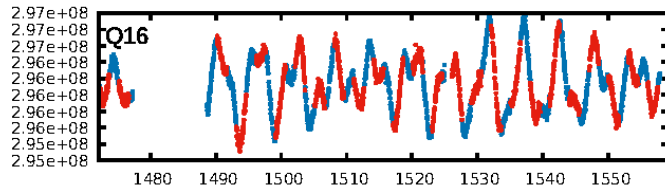
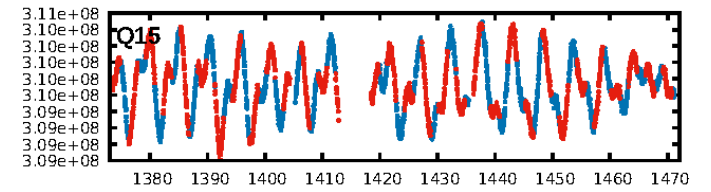
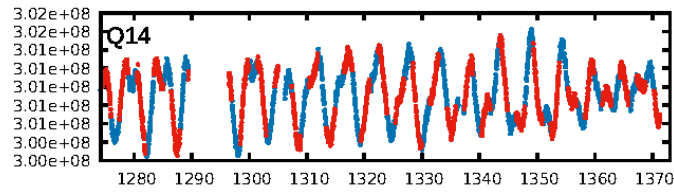
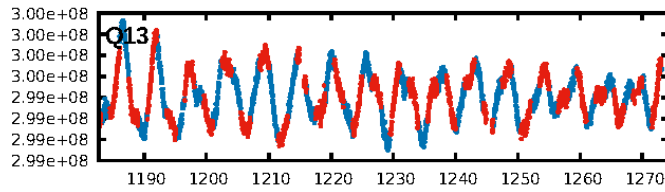
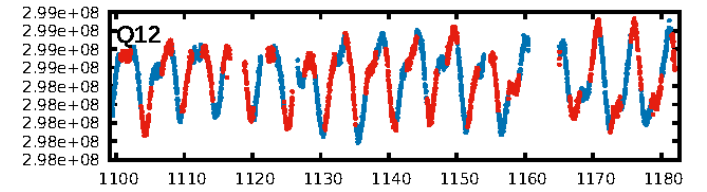
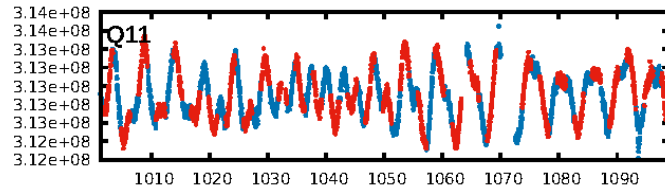
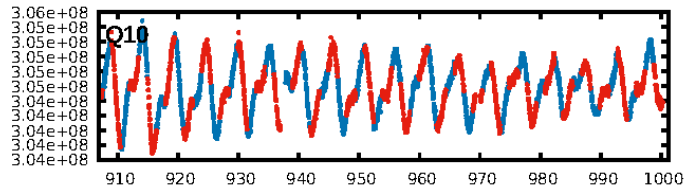
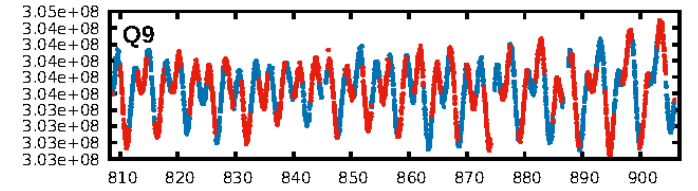
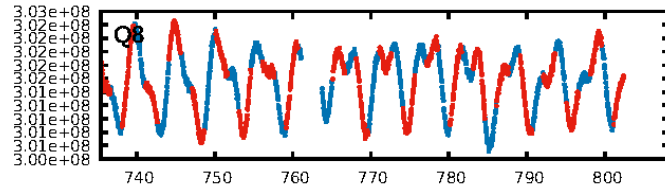
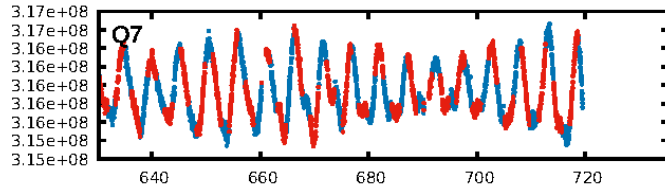
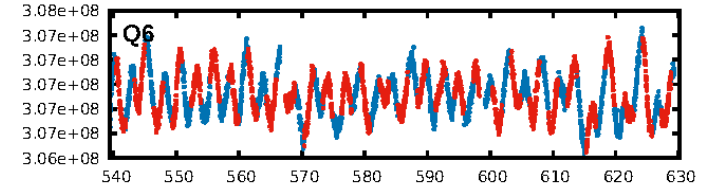
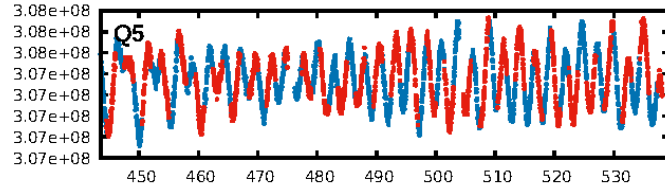
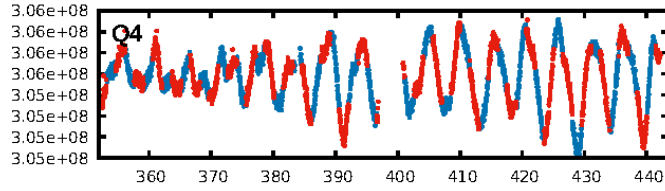
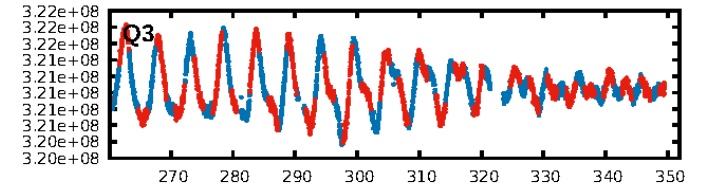
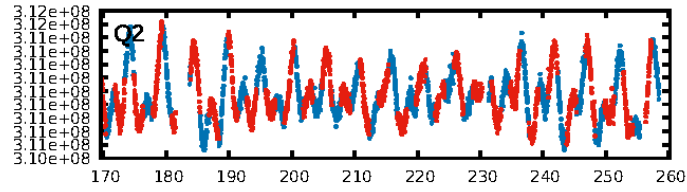
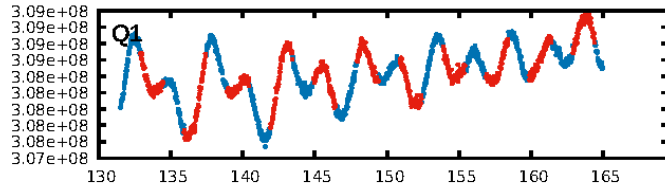
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [54.39σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.11e-11
RollingBand-fgt: 1.00 [440/440]
GhostDiagnostic-chr: 0.7419
Centroid-sig: 6.0%
Centroid-so: 0.683 arcsec [1.39σ]
OotOffset-rm: 1.158 arcsec [0.95σ]
KicOffset-rm: 1.022 arcsec [0.90σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.36 [5/14]
DiffImageOverlap-fno: 1.00 [17/17]

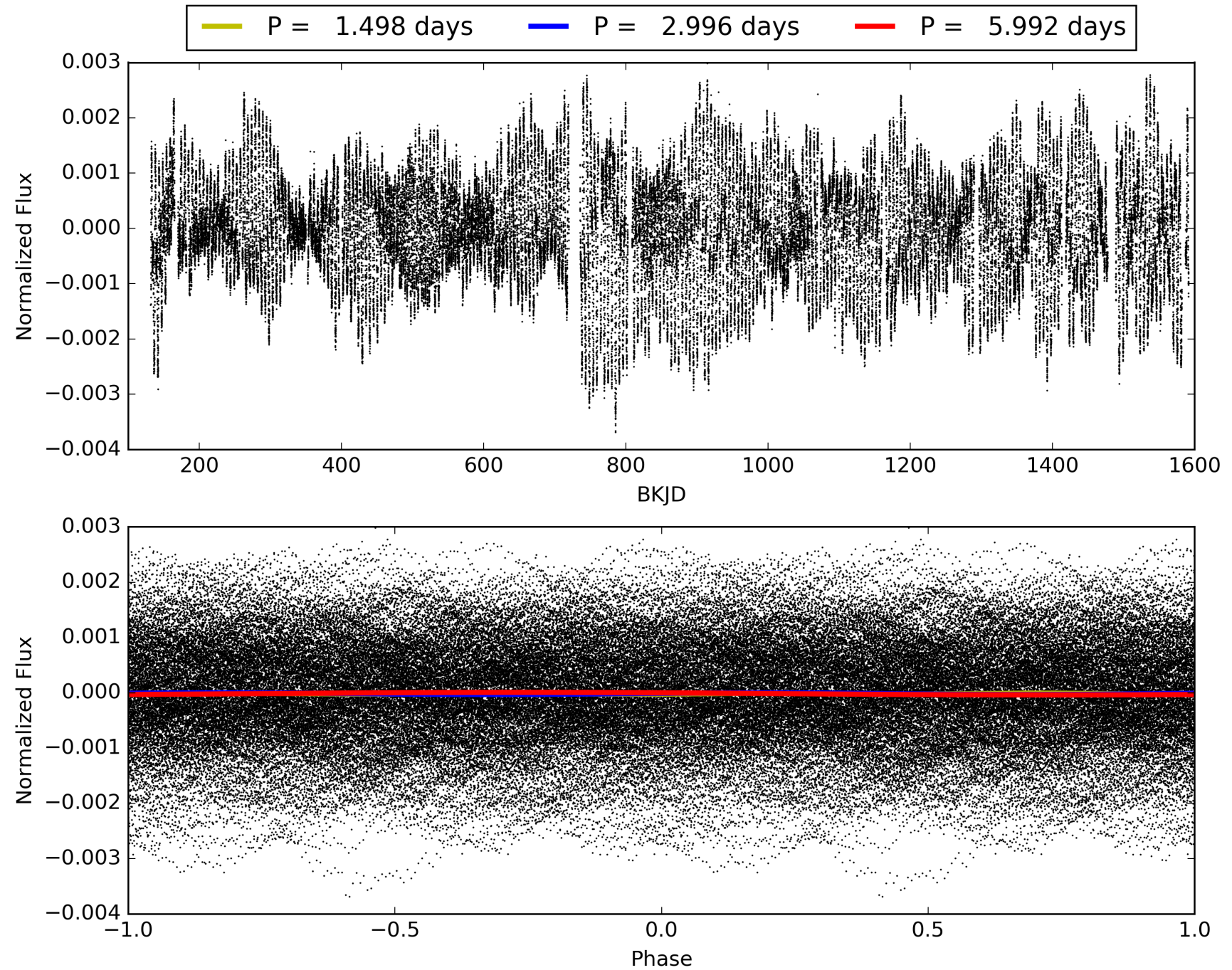
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:21:35 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-01, PDC Light Curves

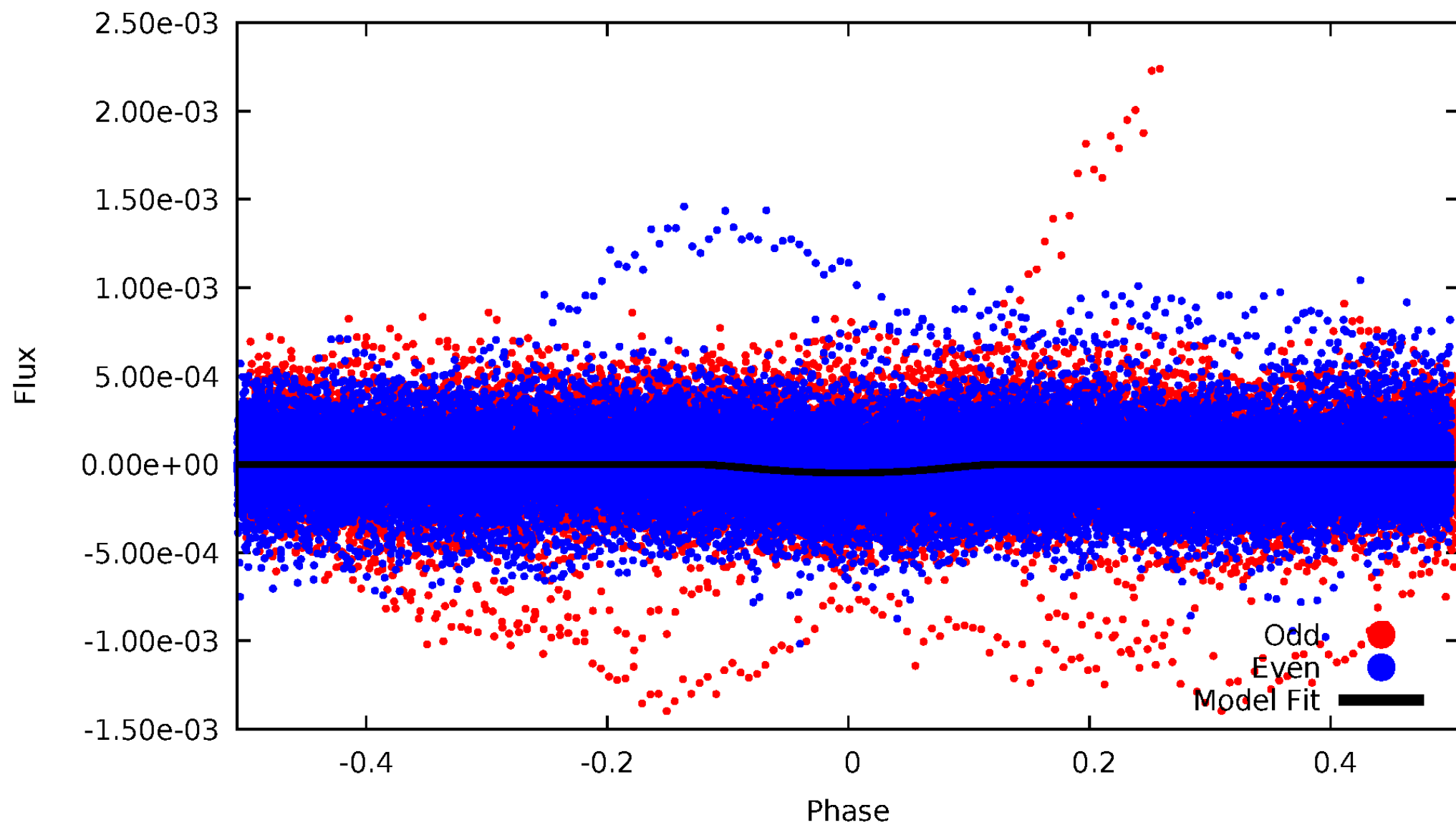


TCE 012457978-01



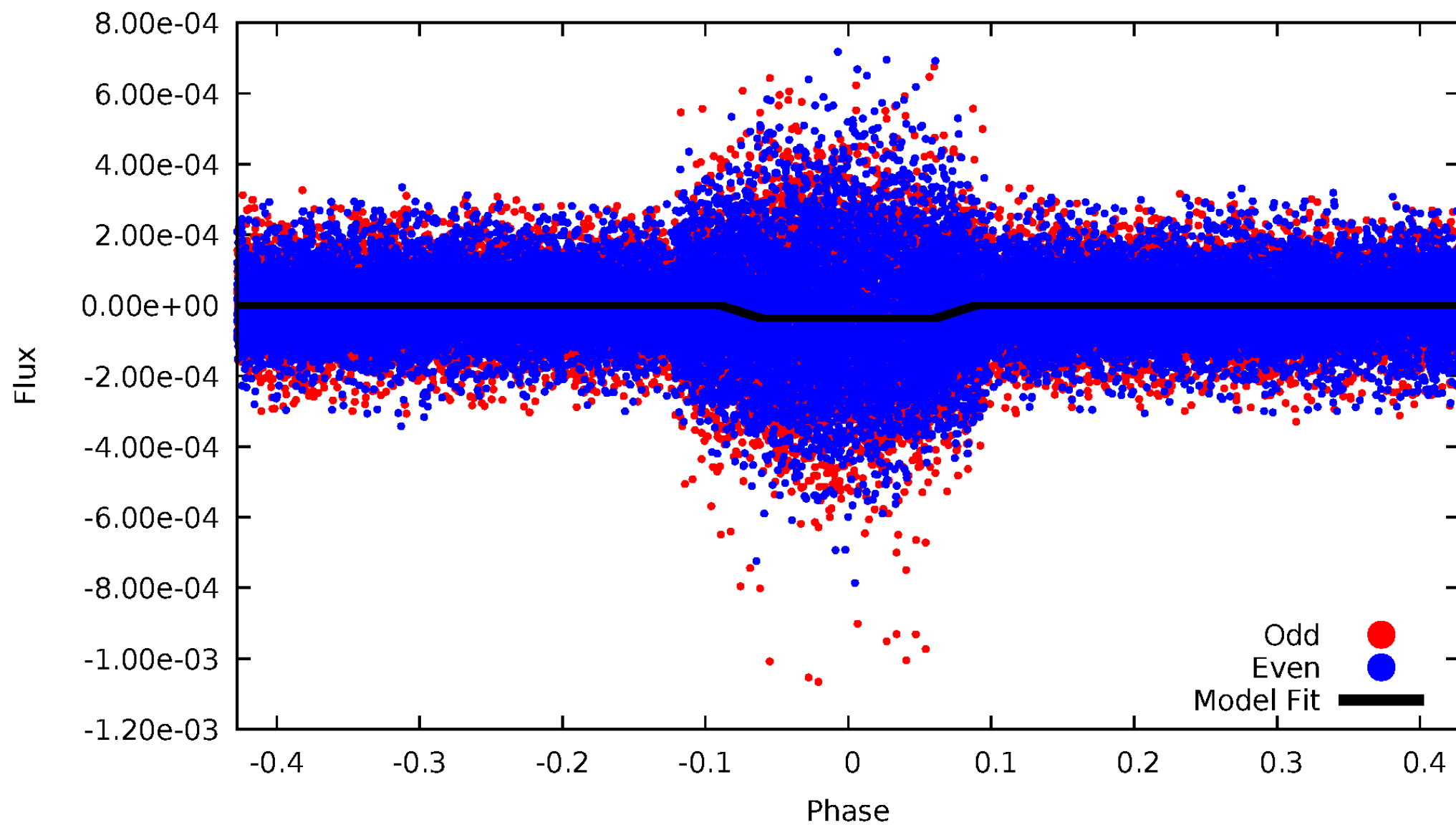
DV Odd/Even

TCE 012457978-01

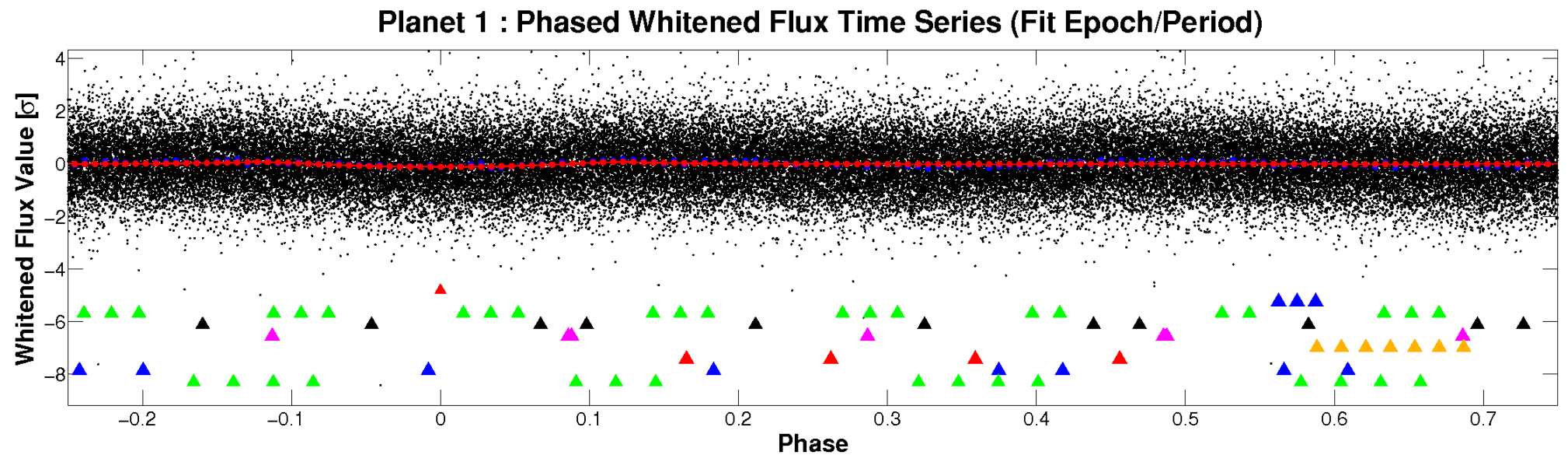
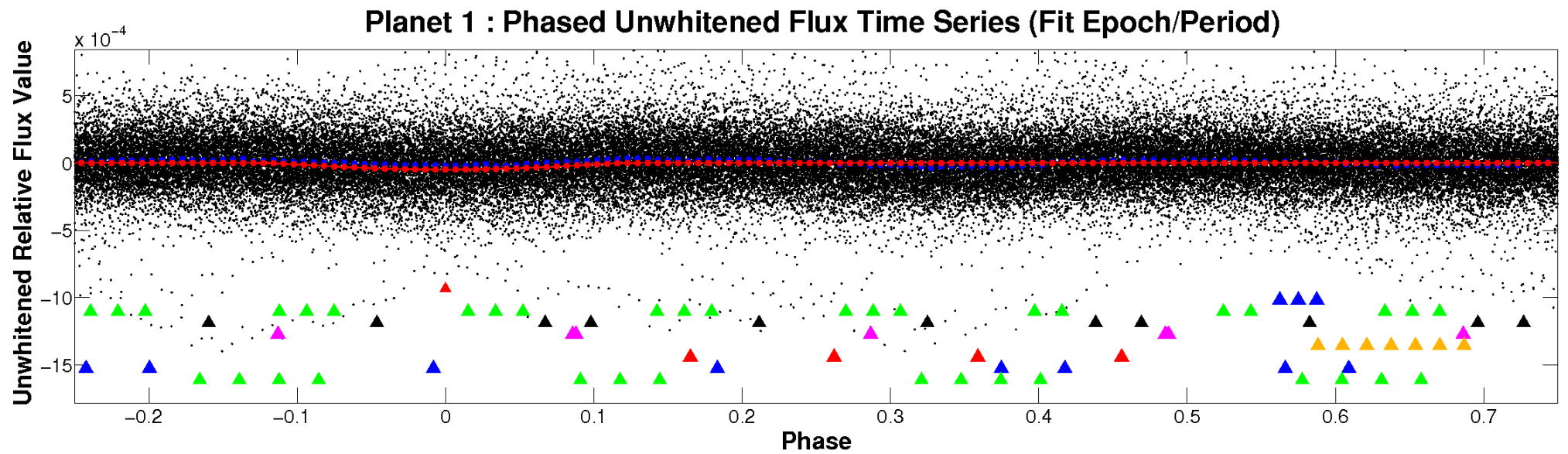


ALT Odd/Even

TCE 012457978-01

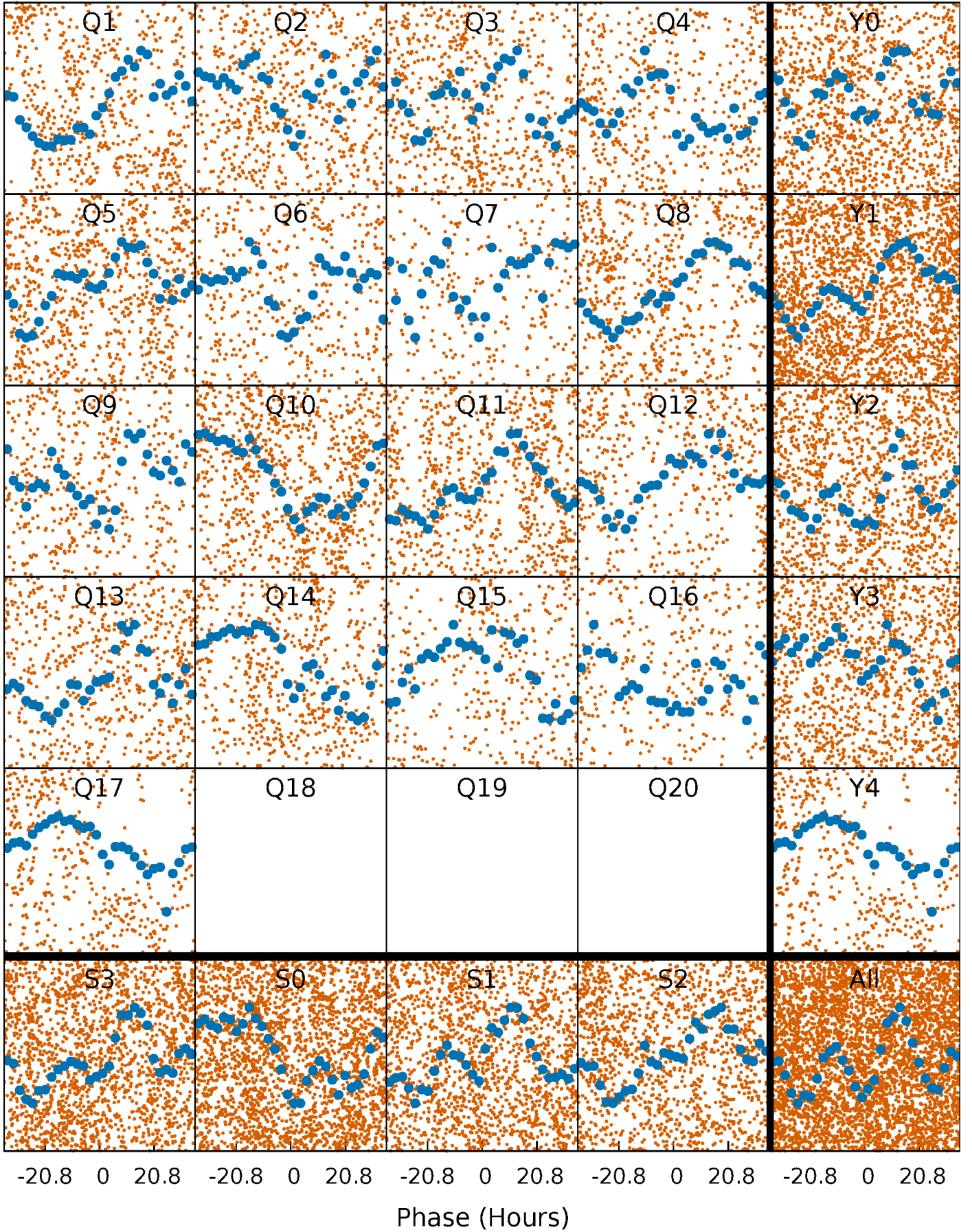


Non-Whitened Vs. Whitened Light Curve



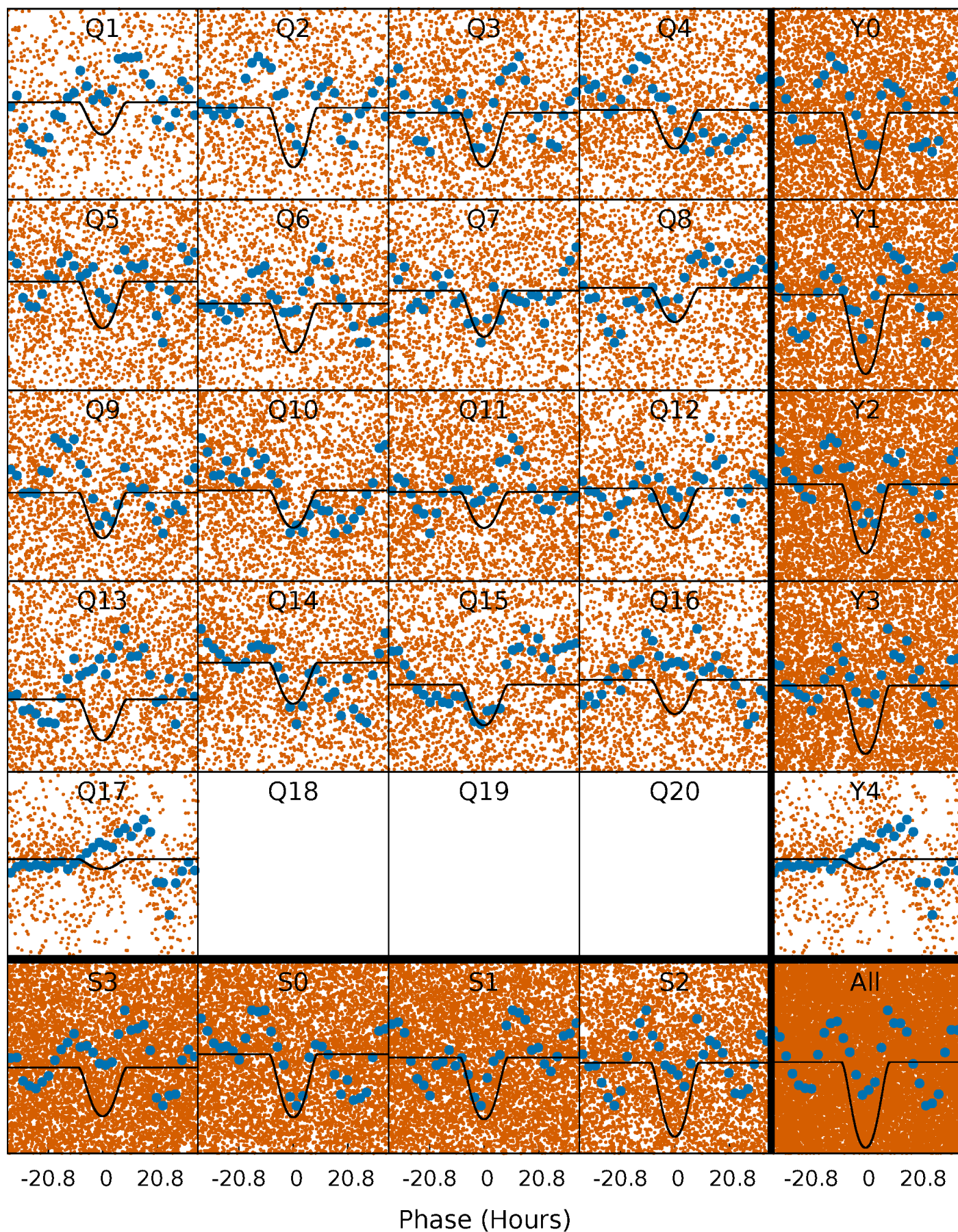
PDC Quarter-Phased Transit Curves

TCE 012457978-01 P= 2.996126 Days $T_0=133.677816$ (BKJD)



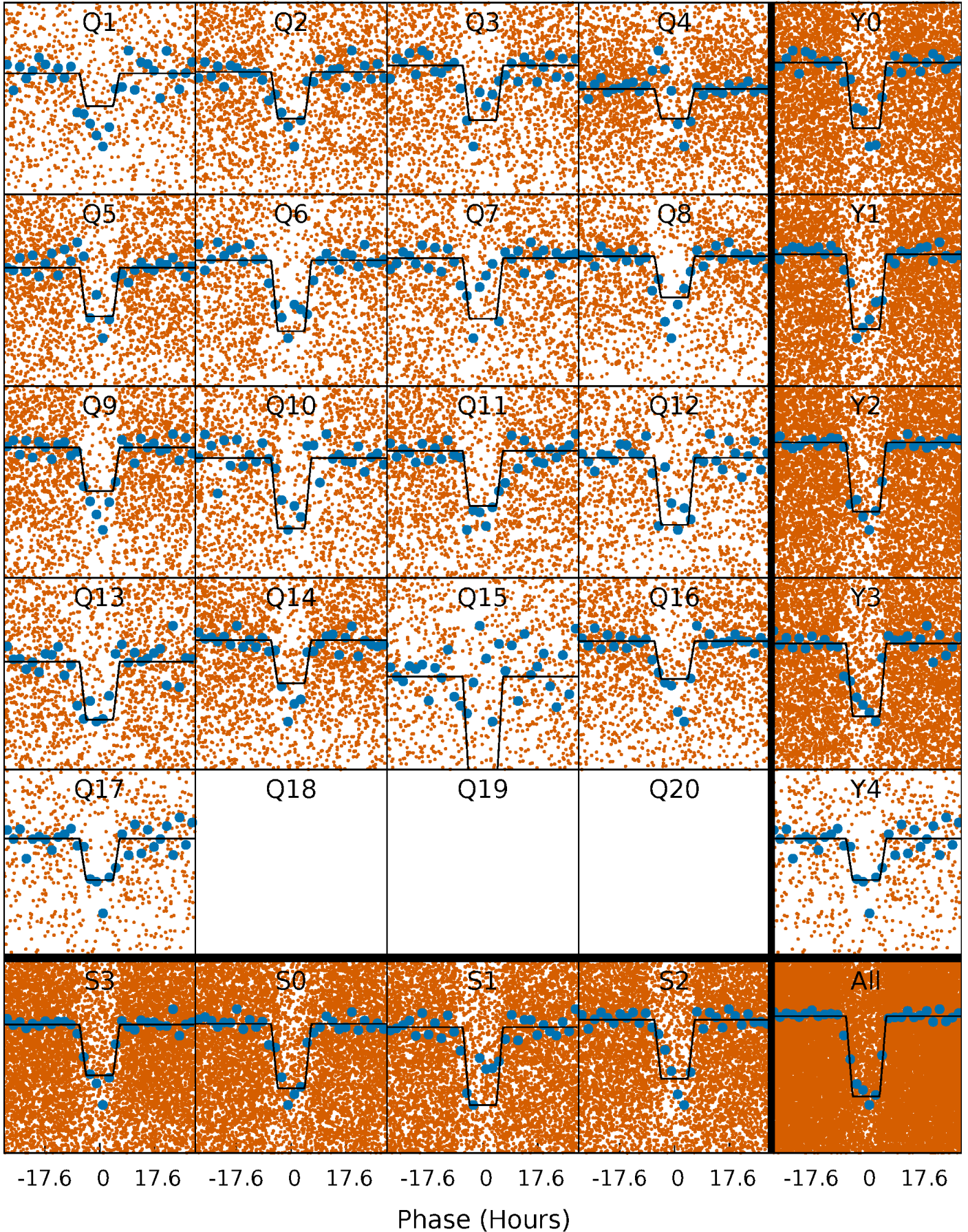
DV Quarter-Phased Transit Curves

TCE 012457978-01 P= 2.996126 Days $T_0=133.677816$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

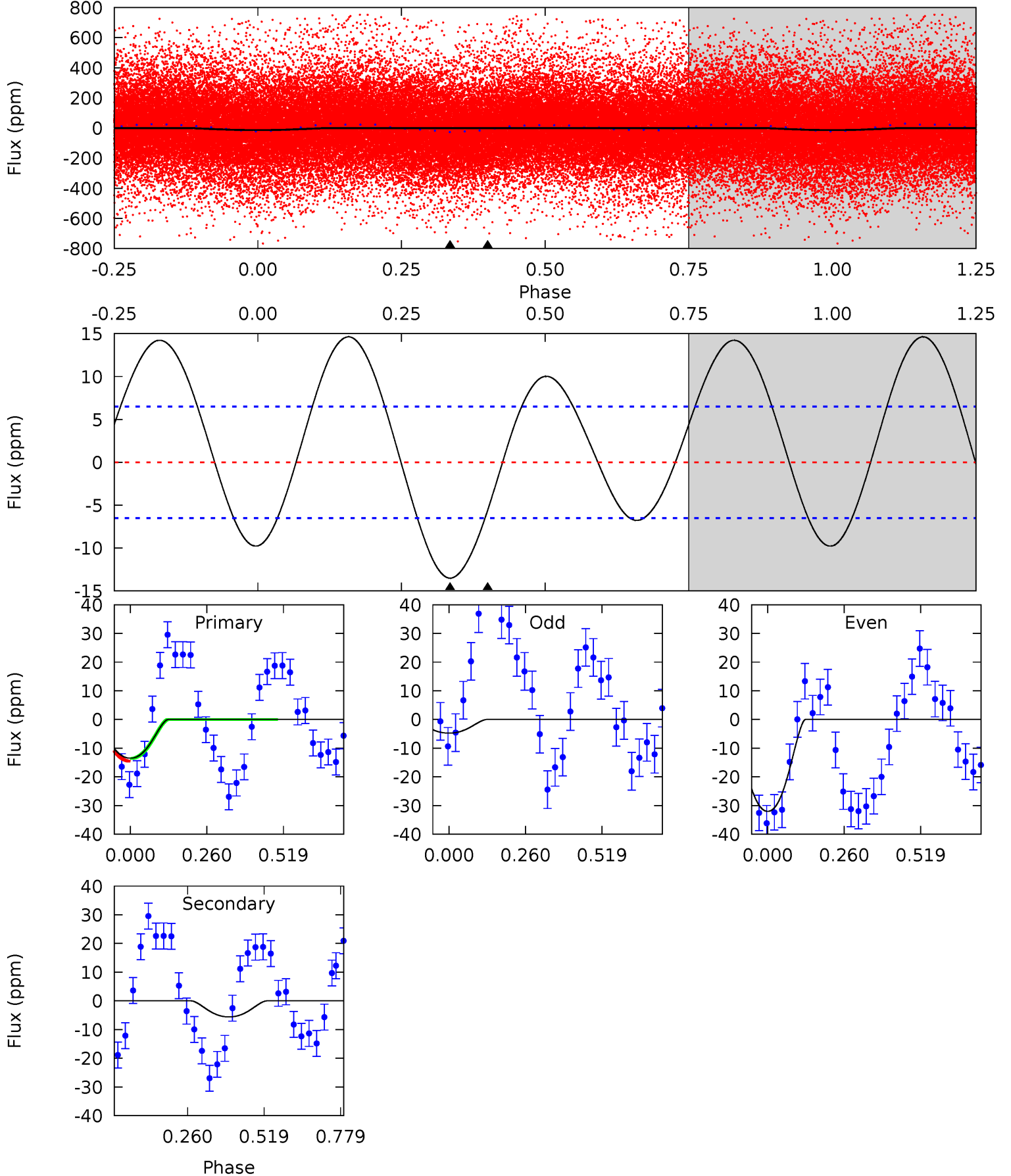
TCE 012457978-01 P= 2.996235 Days $T_0=133.714715$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-01, P = 2.996126 Days, E = 130.681690 Days

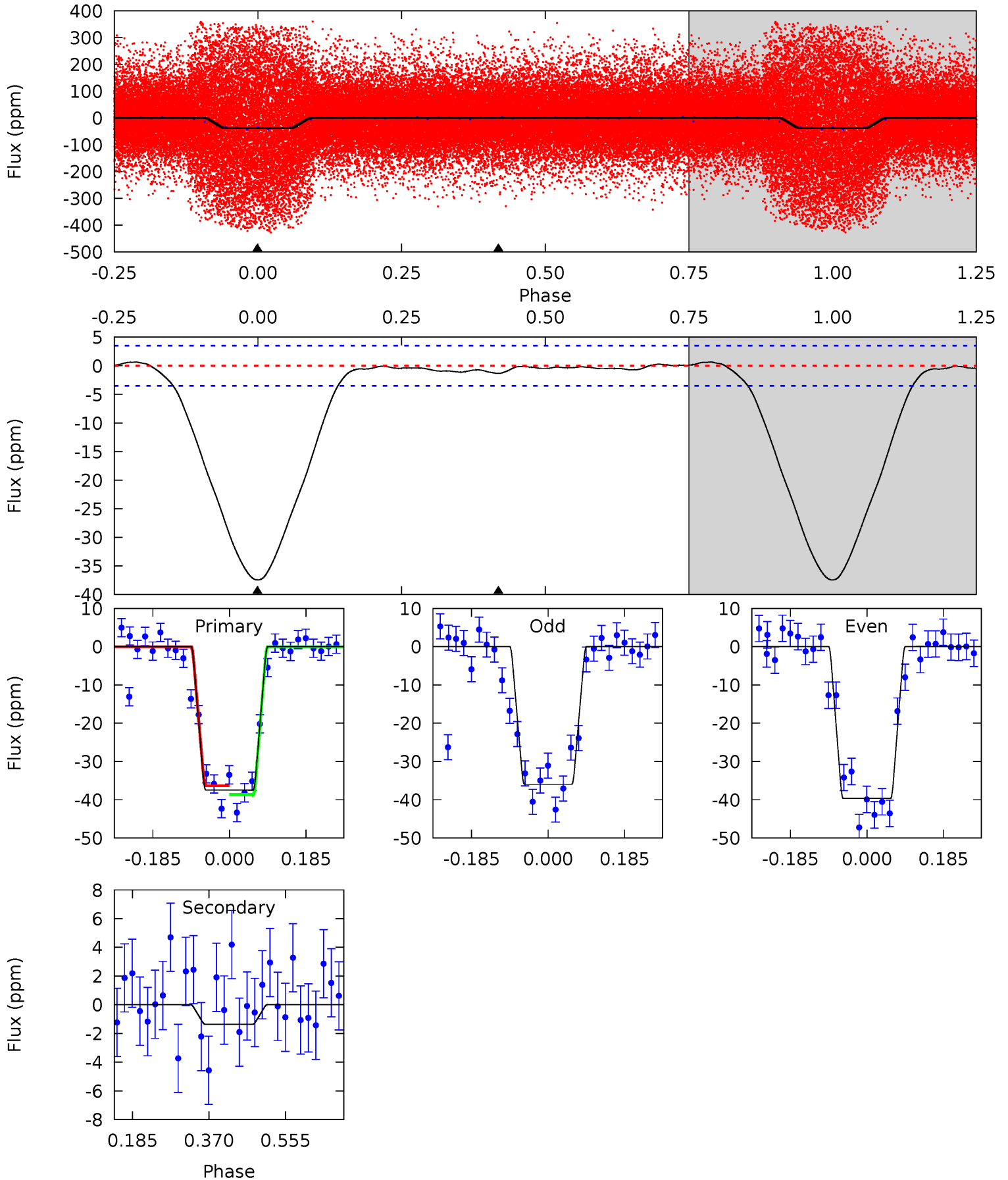
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.06	3.74	0	0	4.36	1.13	5.40	9.06	9.06	3.74	3.74	9.18	1.79	0.52	0.31



Alt Model-Shift Uniqueness Test

012457978-01, P = 2.996235 Days, E = 130.718480 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.2	1.71	0	0	4.43	1.33	0.51	47.2	47.2	1.71	1.71	2.35	1.22	0.02	1.45



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-6 ± 1	$2.59^{+0.63}_{-0.63}$	3151^{+190}_{-257}	3626^{+430}_{-405}	$1.041^{+0.838}_{-0.424}$
Alt.	-1 ± 1	$1.67^{+0.55}_{-0.54}$	3146^{+192}_{-294}	3141^{+642}_{-5829}	$0.585^{+0.830}_{-0.371}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

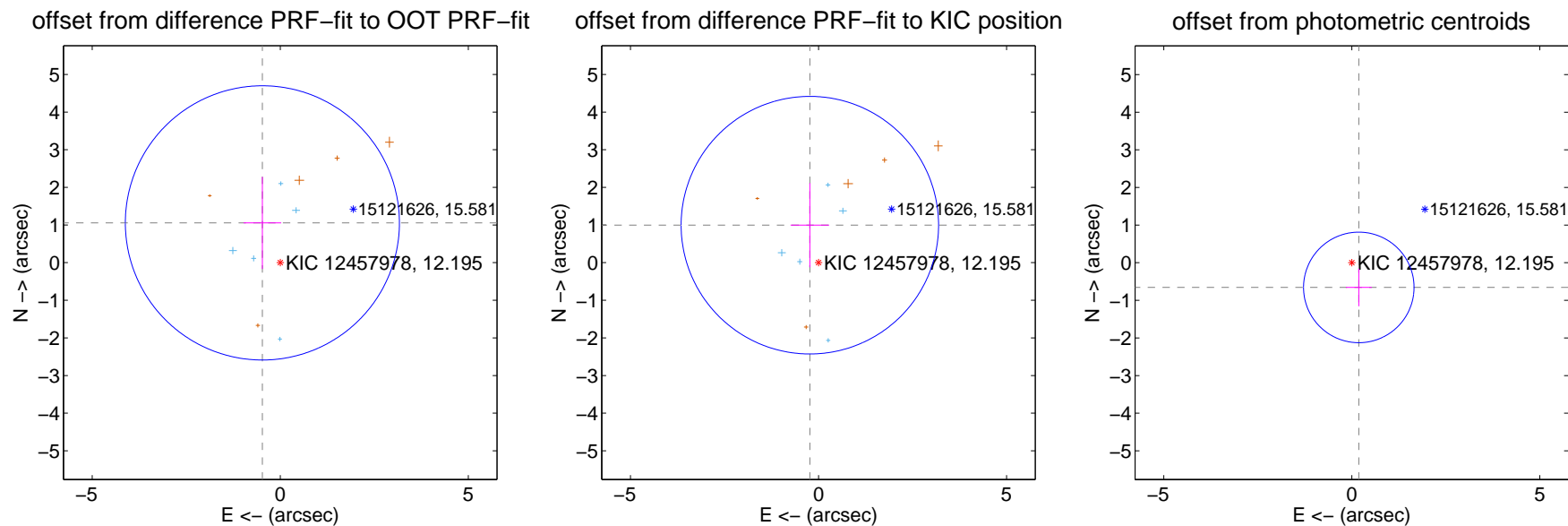
DV Centroid Data

Supplemental centroid analysis for 012457978-01. Kepler magnitude: 12.20. Transit SNR 10.34

There are 5 quarters with good PRF difference image offsets

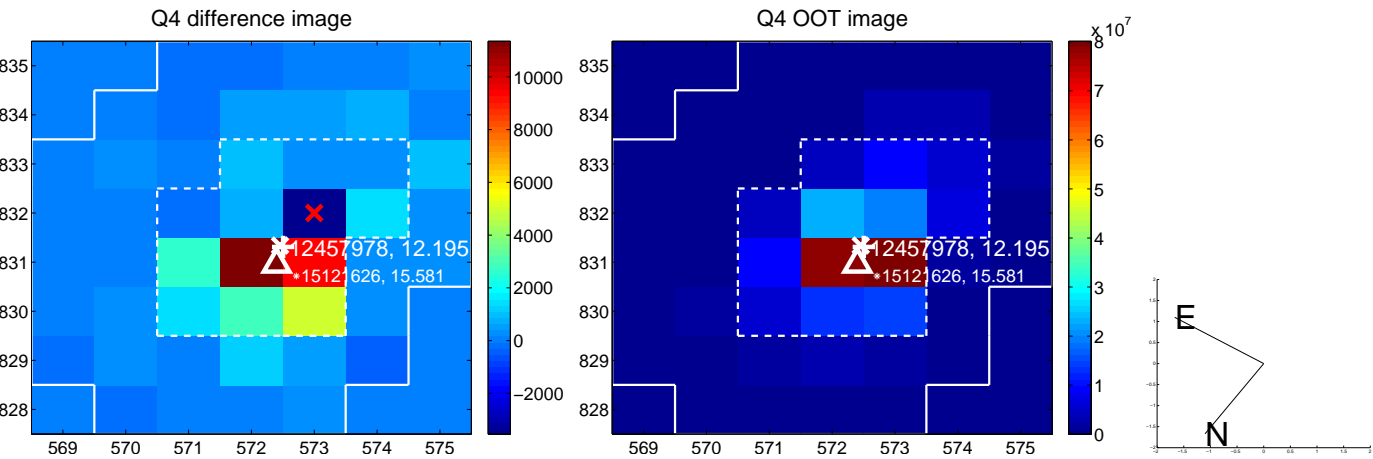
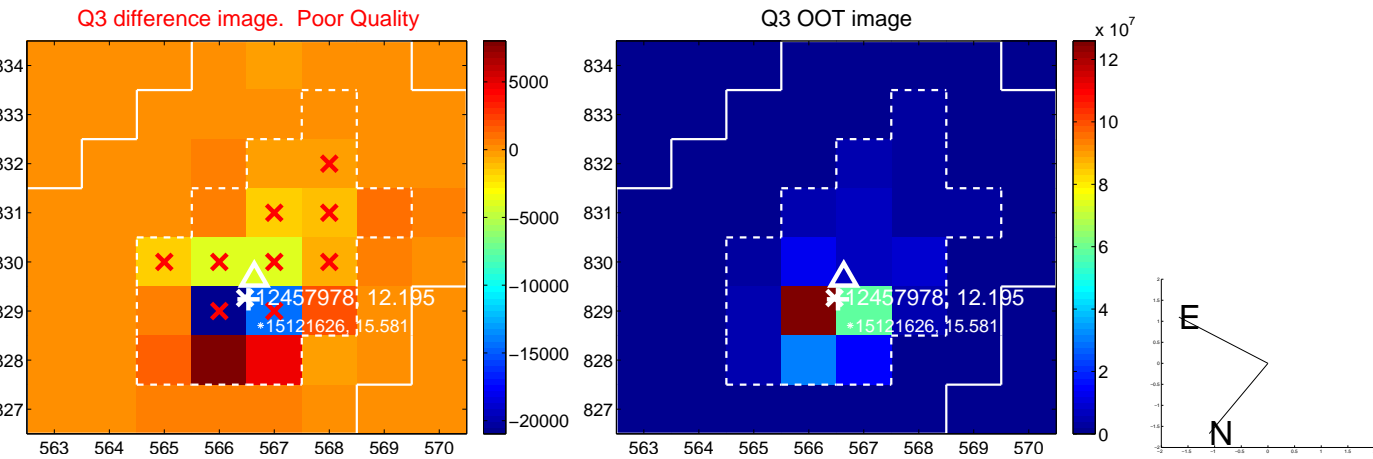
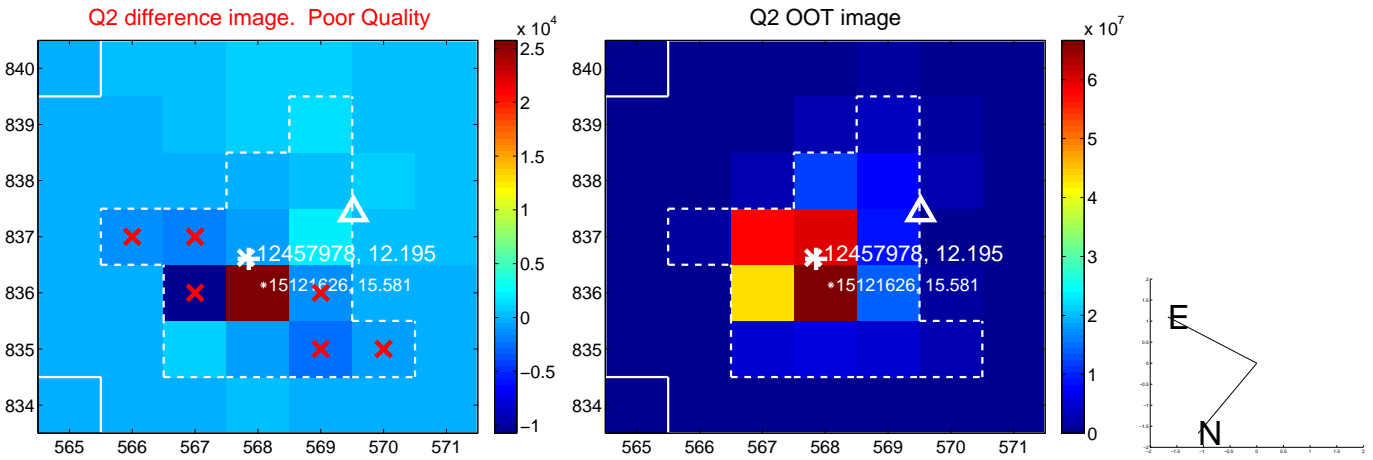
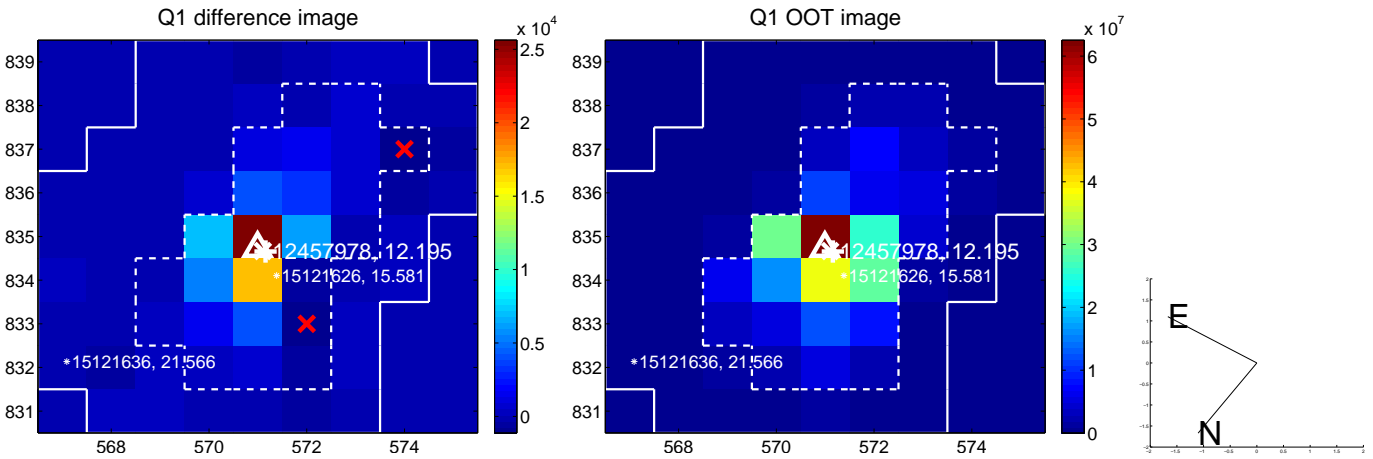
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.158 ± 1.214	0.95	0.476 ± 0.500	1.056 ± 1.223
PRF-fit source offset from KIC position	1.022 ± 1.141	0.90	0.231 ± 0.511	0.995 ± 1.116
photometric centroid source offset	0.68 ± 0.49	1.39	-0.19 ± 0.34	-0.66 ± 0.50

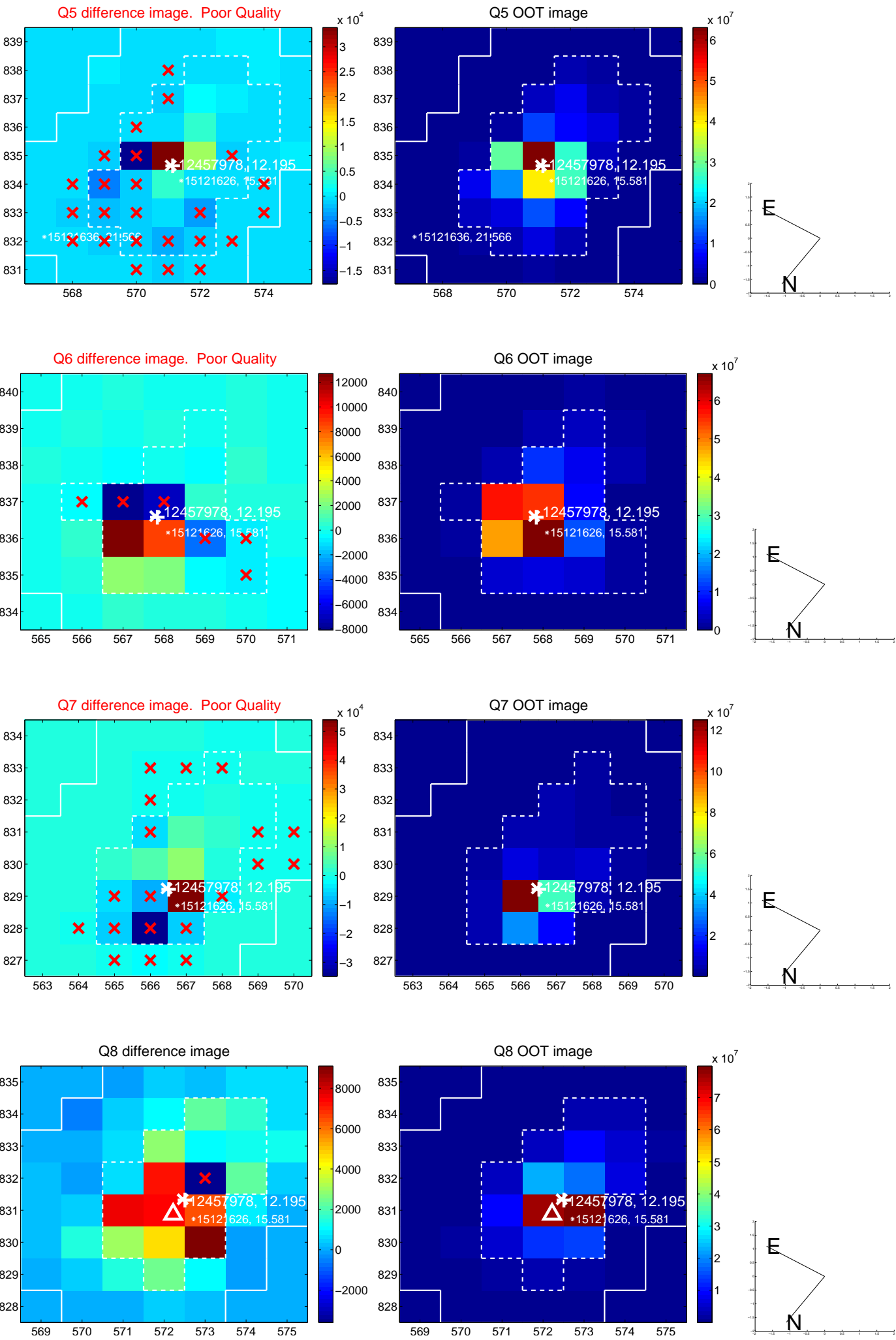


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

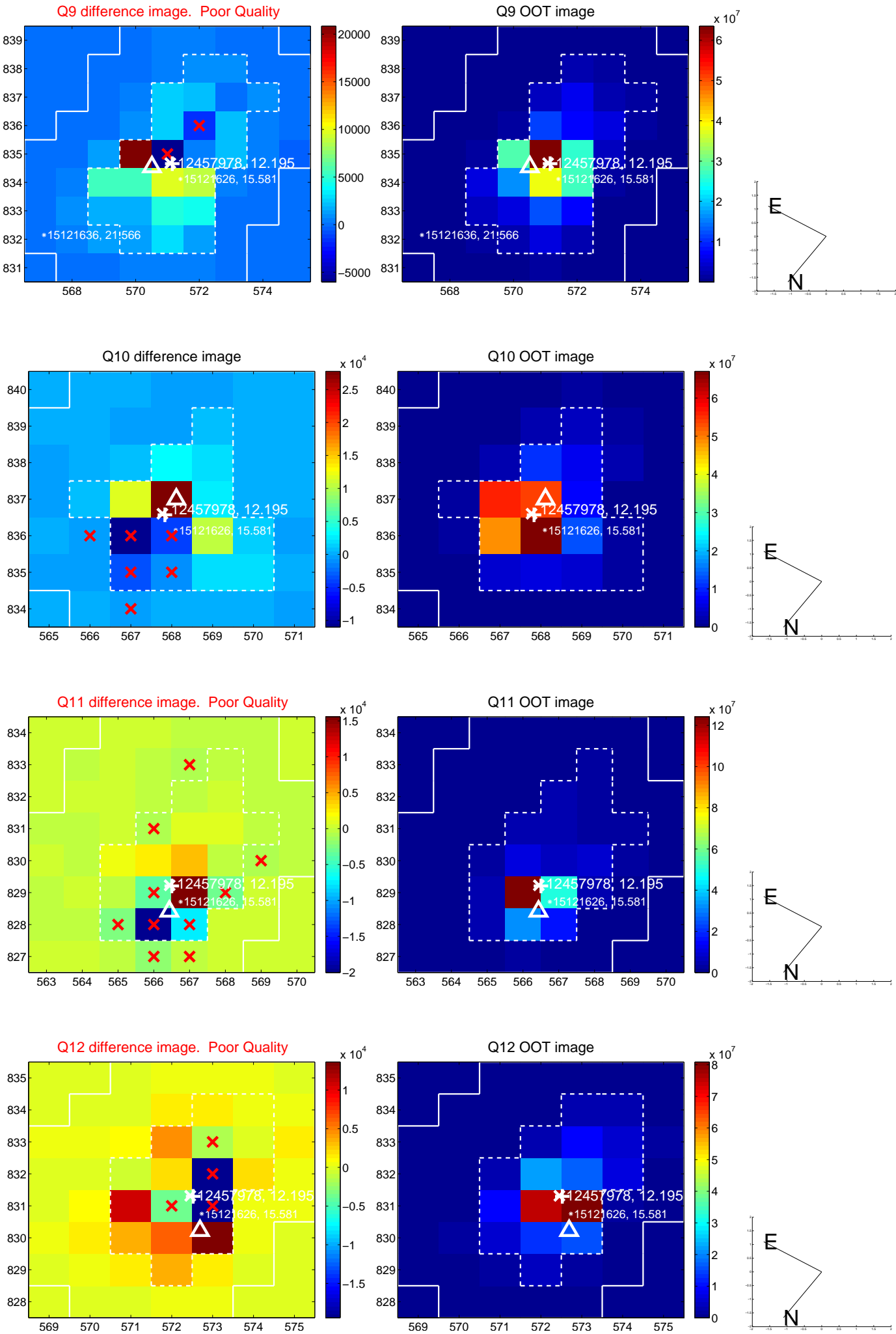
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



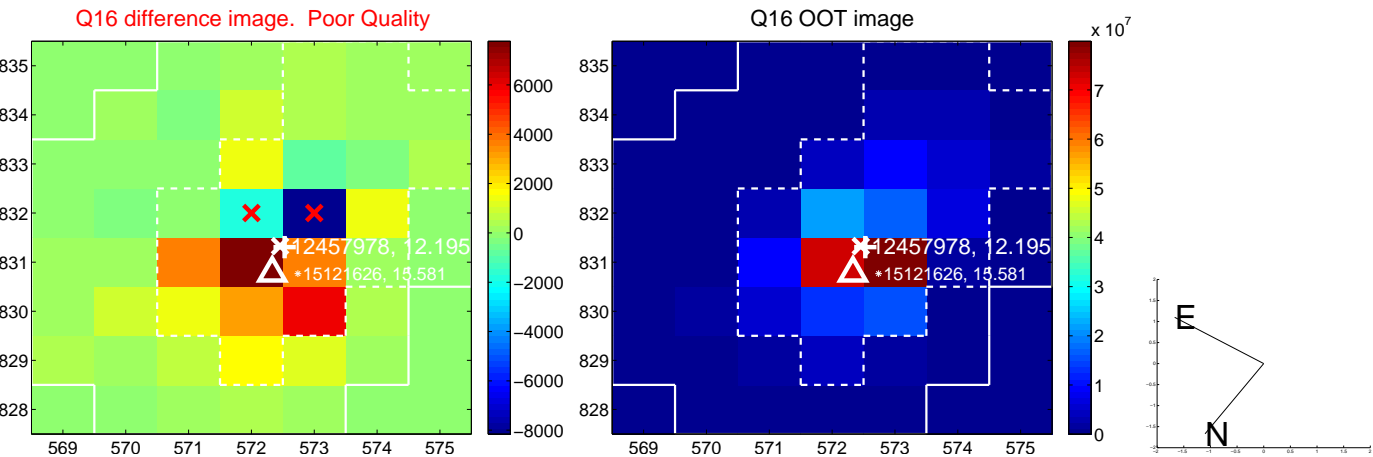
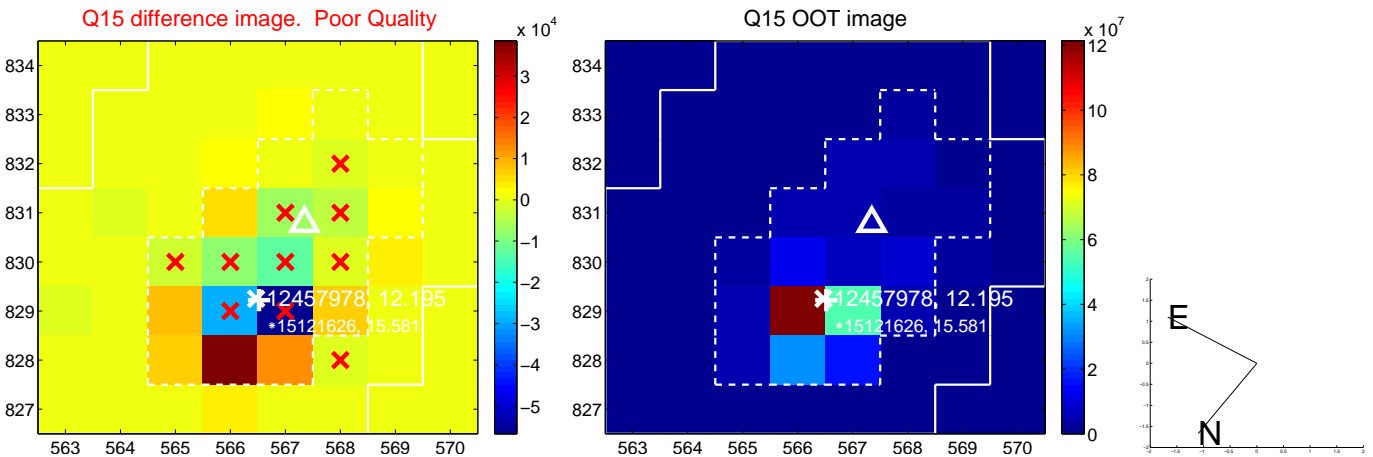
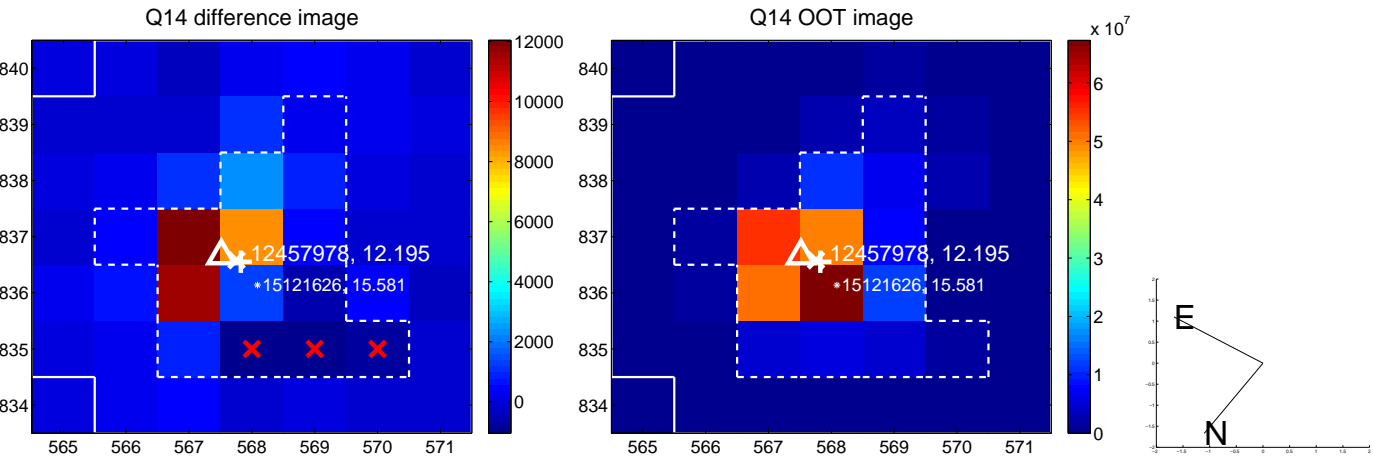
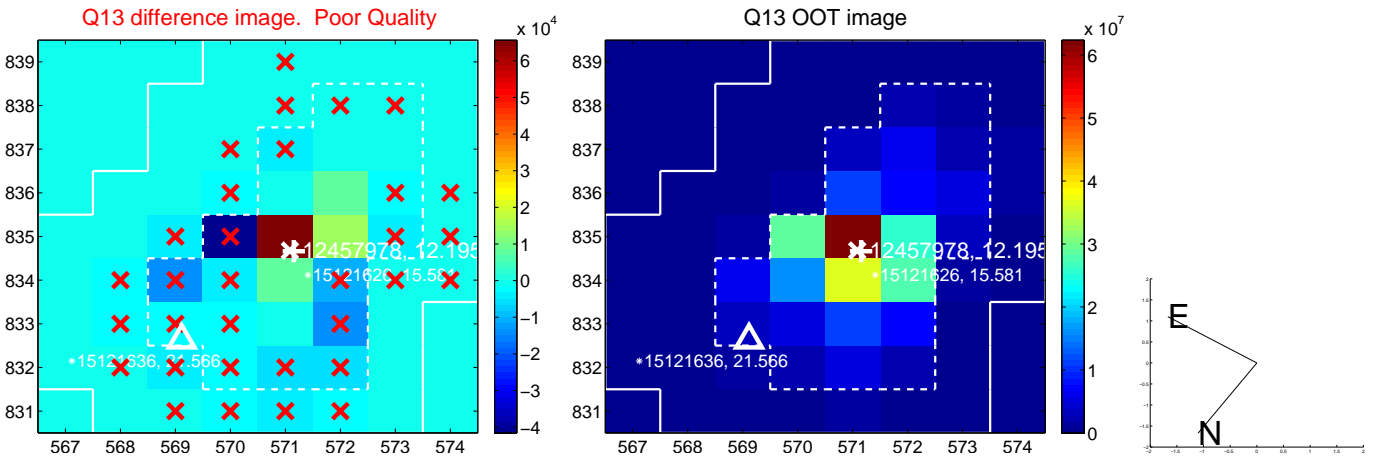
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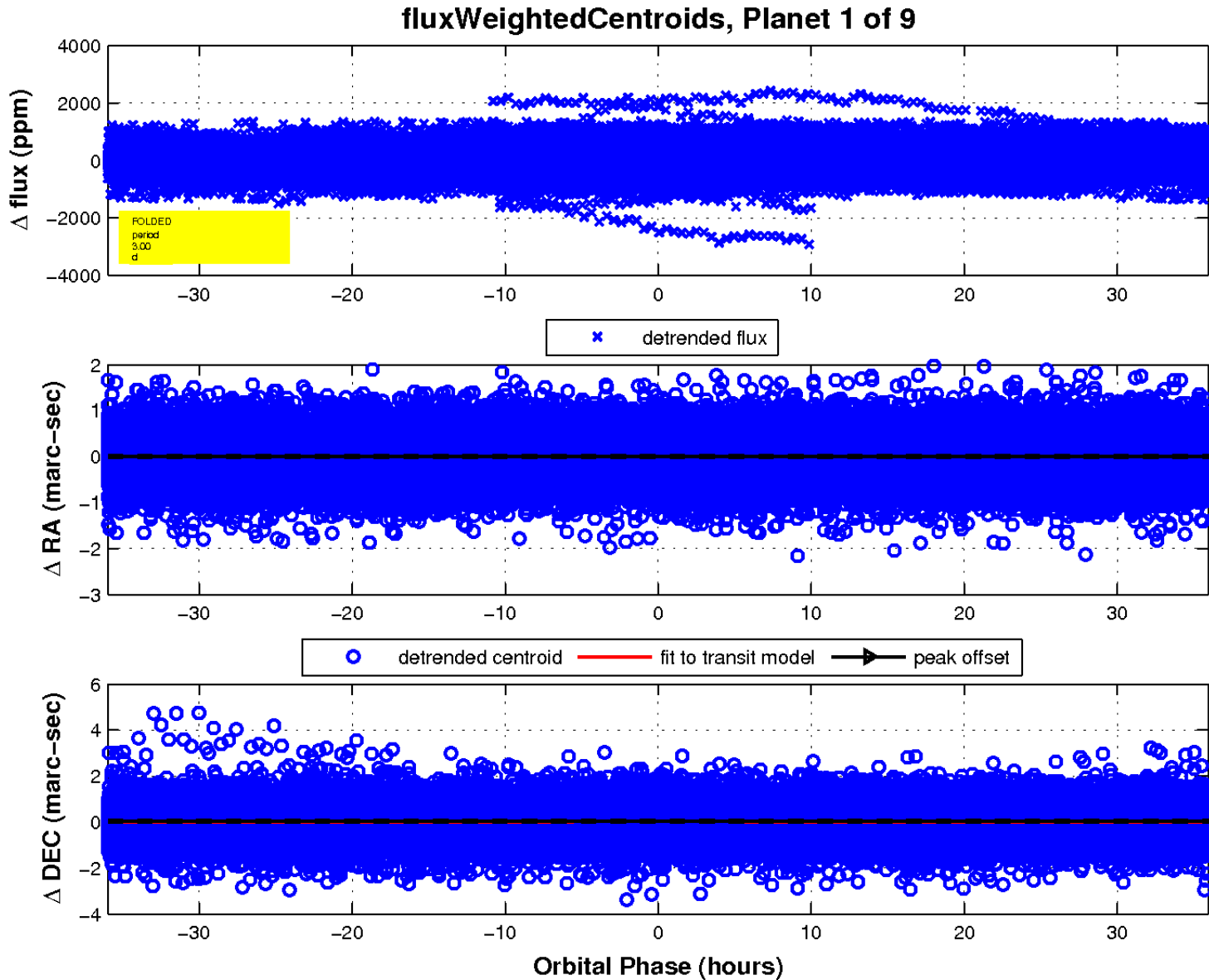
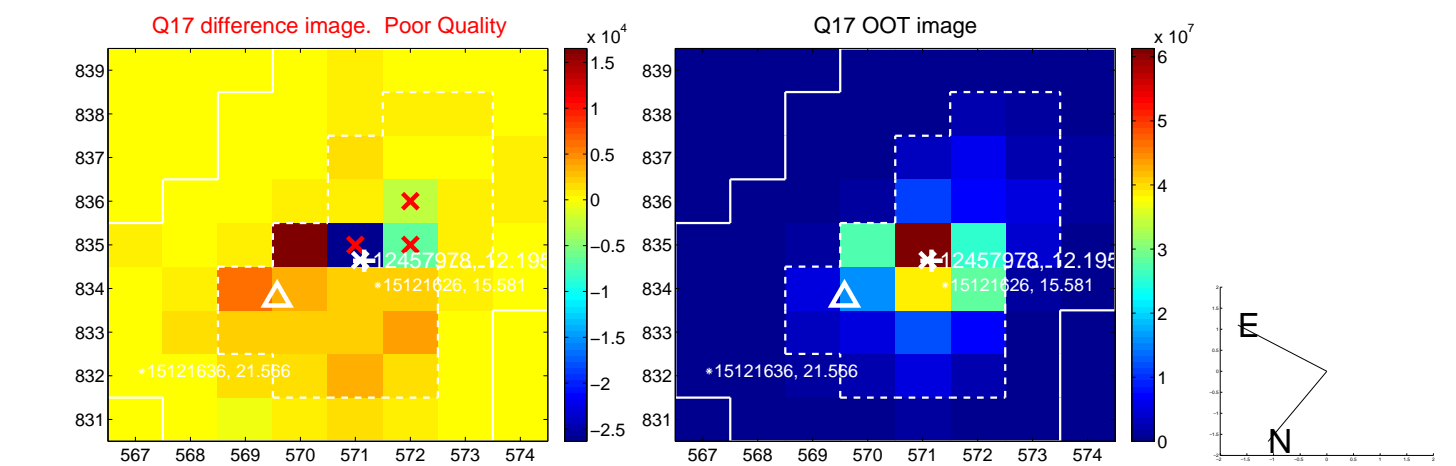
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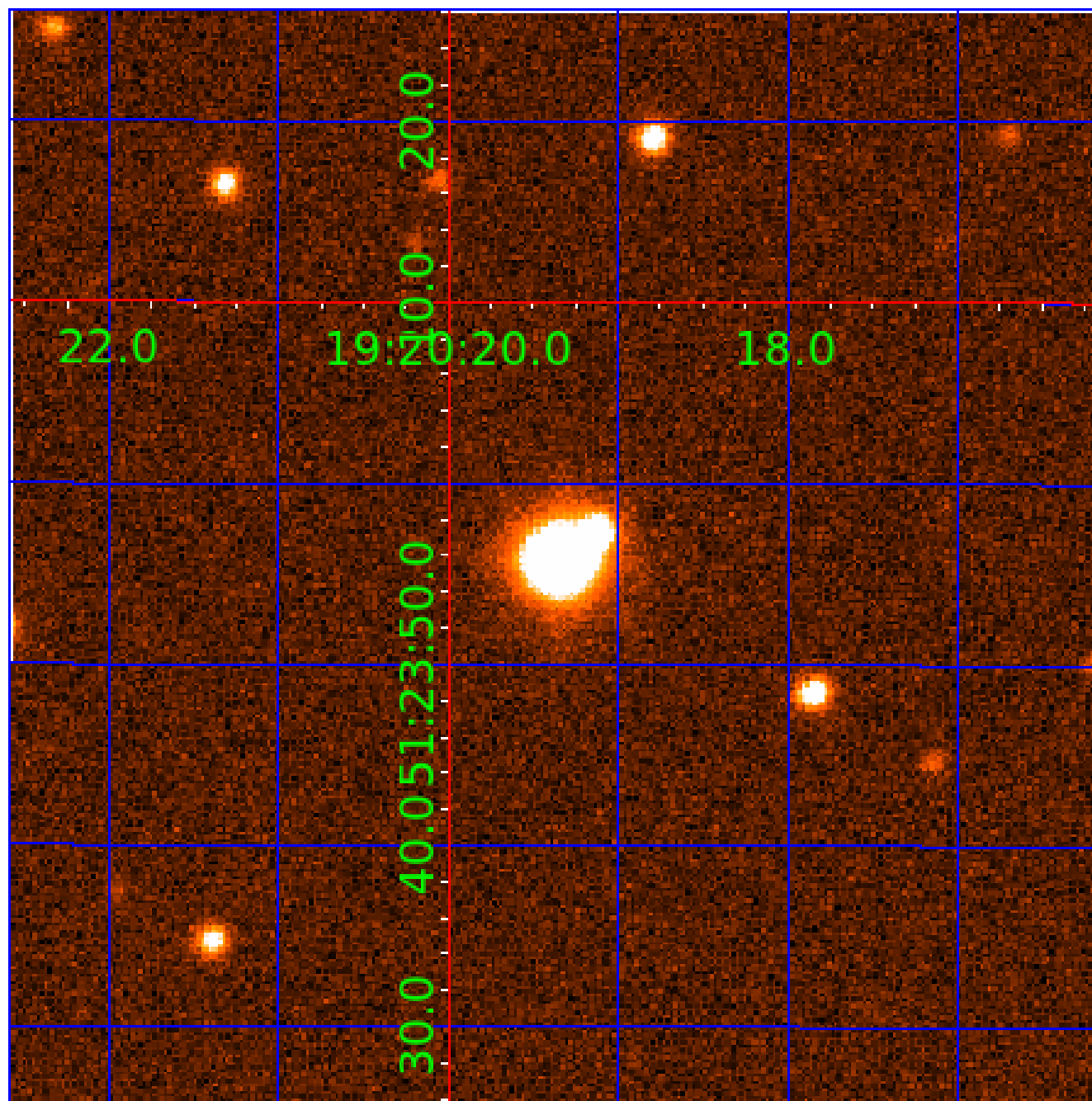


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

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Robovetter Results

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012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

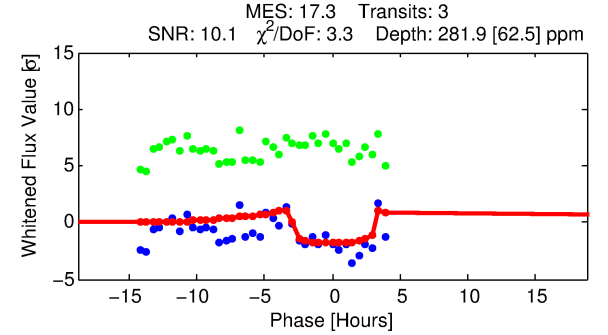
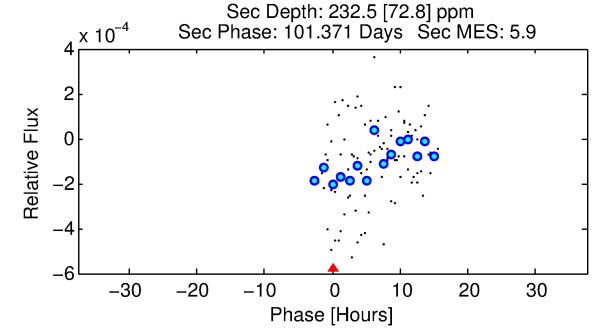
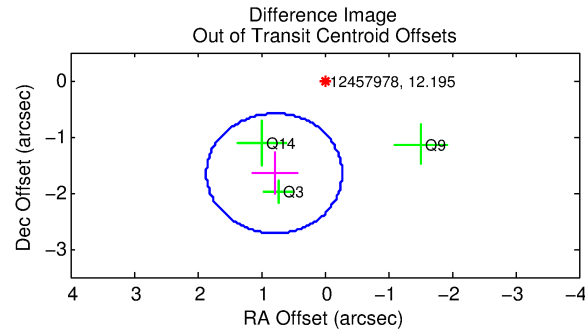
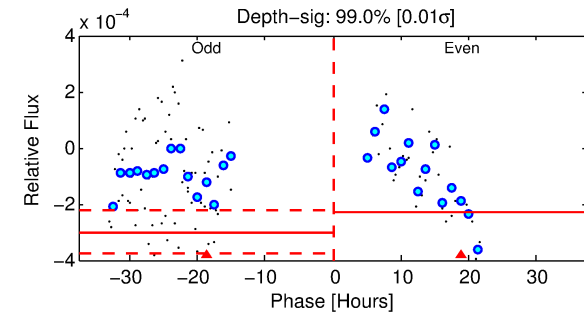
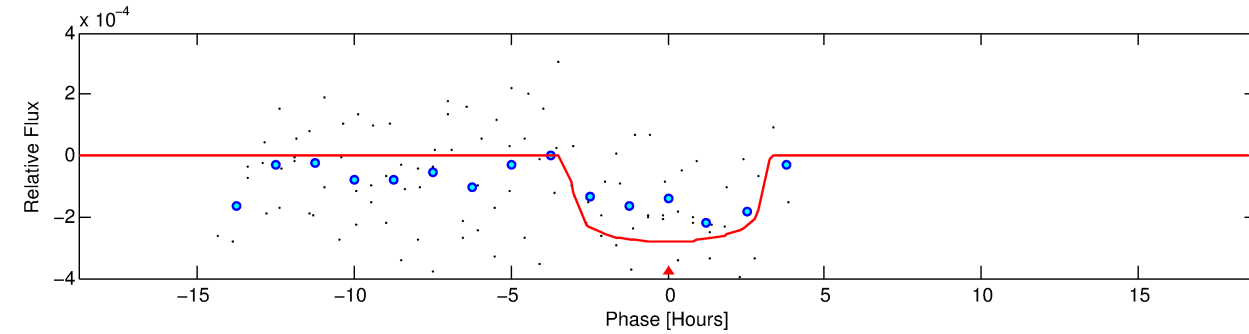
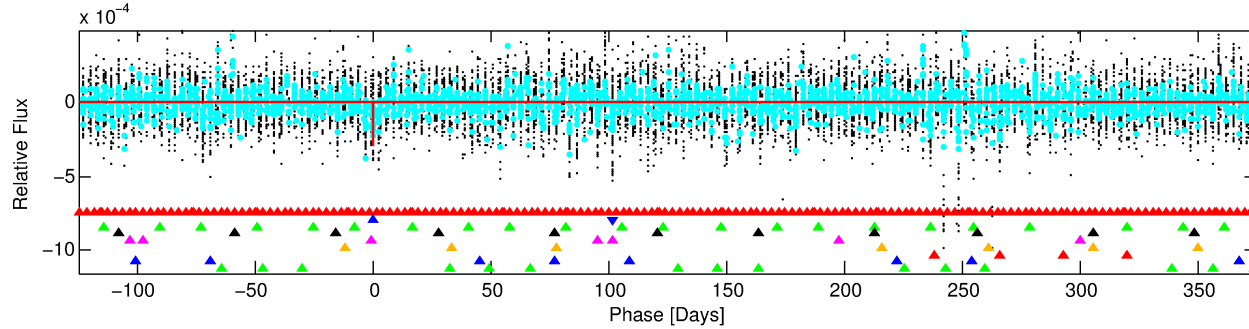
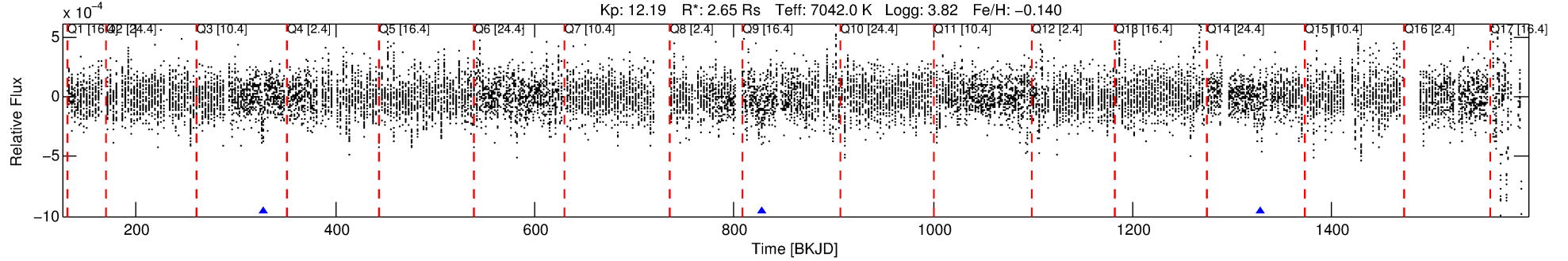
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-02

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 2 of 9 Period: 500.316 d



DV Fit Results:

Period = 500.31584 [0.01177] d
Epoch = 327.1899 [0.0225] BKJD
Rp/R* = 0.0157 [0.0409]
a/R* = 579.34 [8394.84]
b = 0.36 [35.55]
Seff = 7.14 [3.71]
Teq = 417 [54] K
Rp = 4.55 [11.95] Re
a = 1.4731 [0.4831] AU
Ag = 13438.89 [70452.16] [0.19σ]
Teffp = 6939 [9056] K [0.72σ]

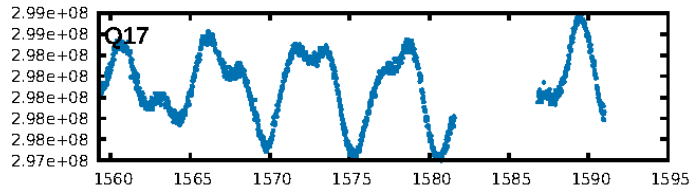
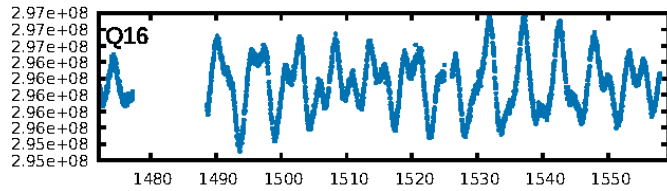
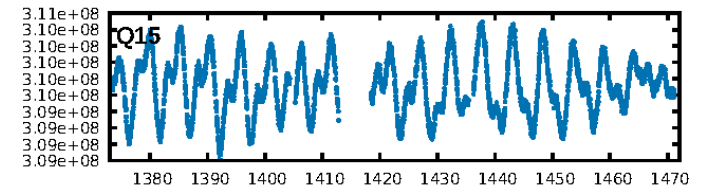
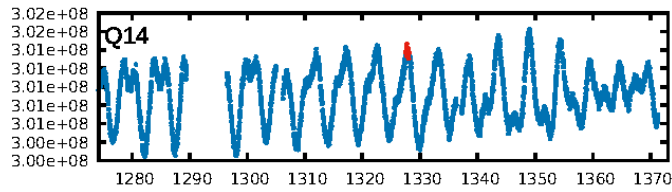
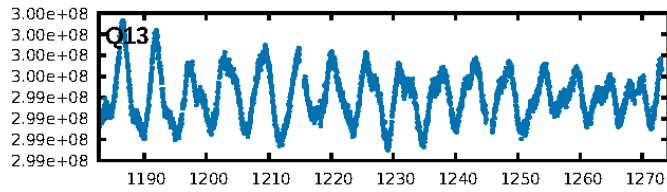
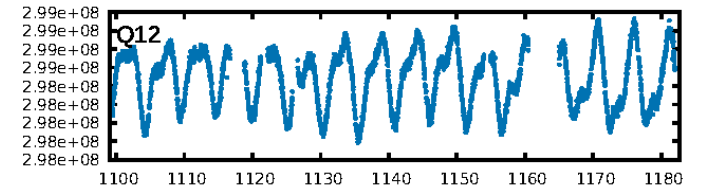
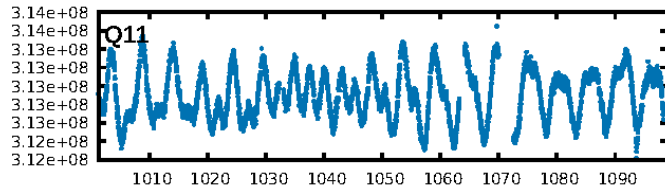
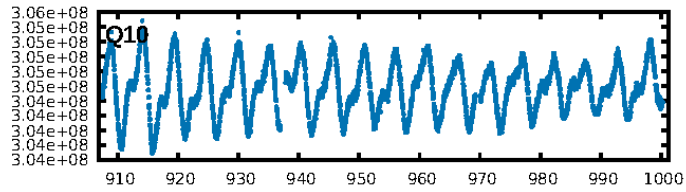
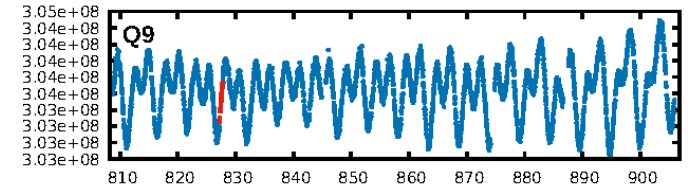
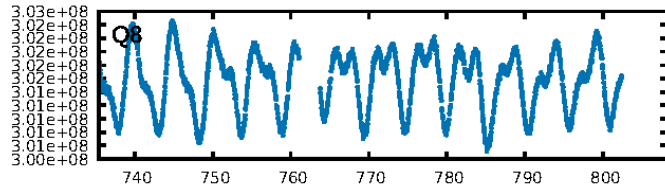
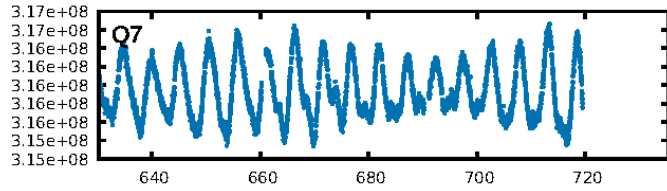
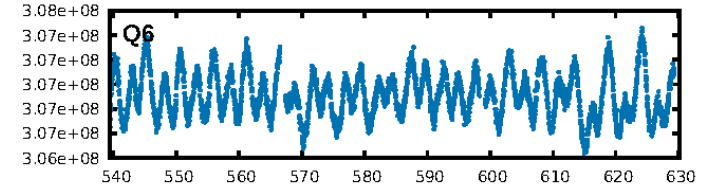
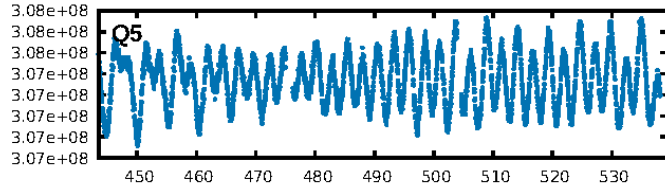
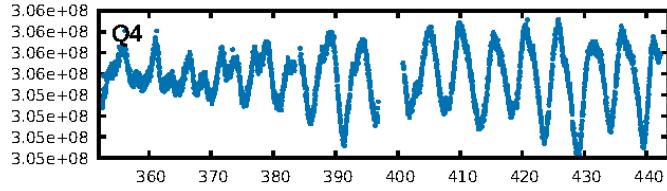
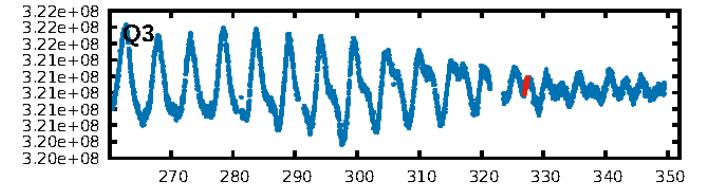
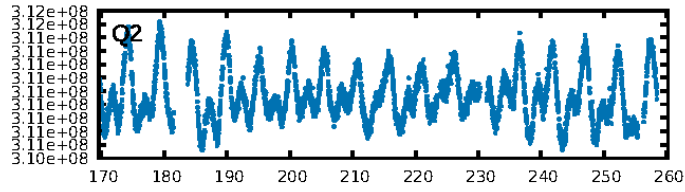
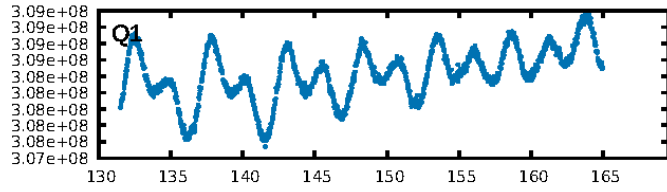
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.62σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 8.25e-21
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -19.18
Centroid-sig: 15.1%
Centroid-so: 1.373 arcsec [1.29σ]
OotOffset-rm: 1.834 arcsec [5.16σ]
KicOffset-rm: 1.787 arcsec [5.11σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 0.67 [2/3]

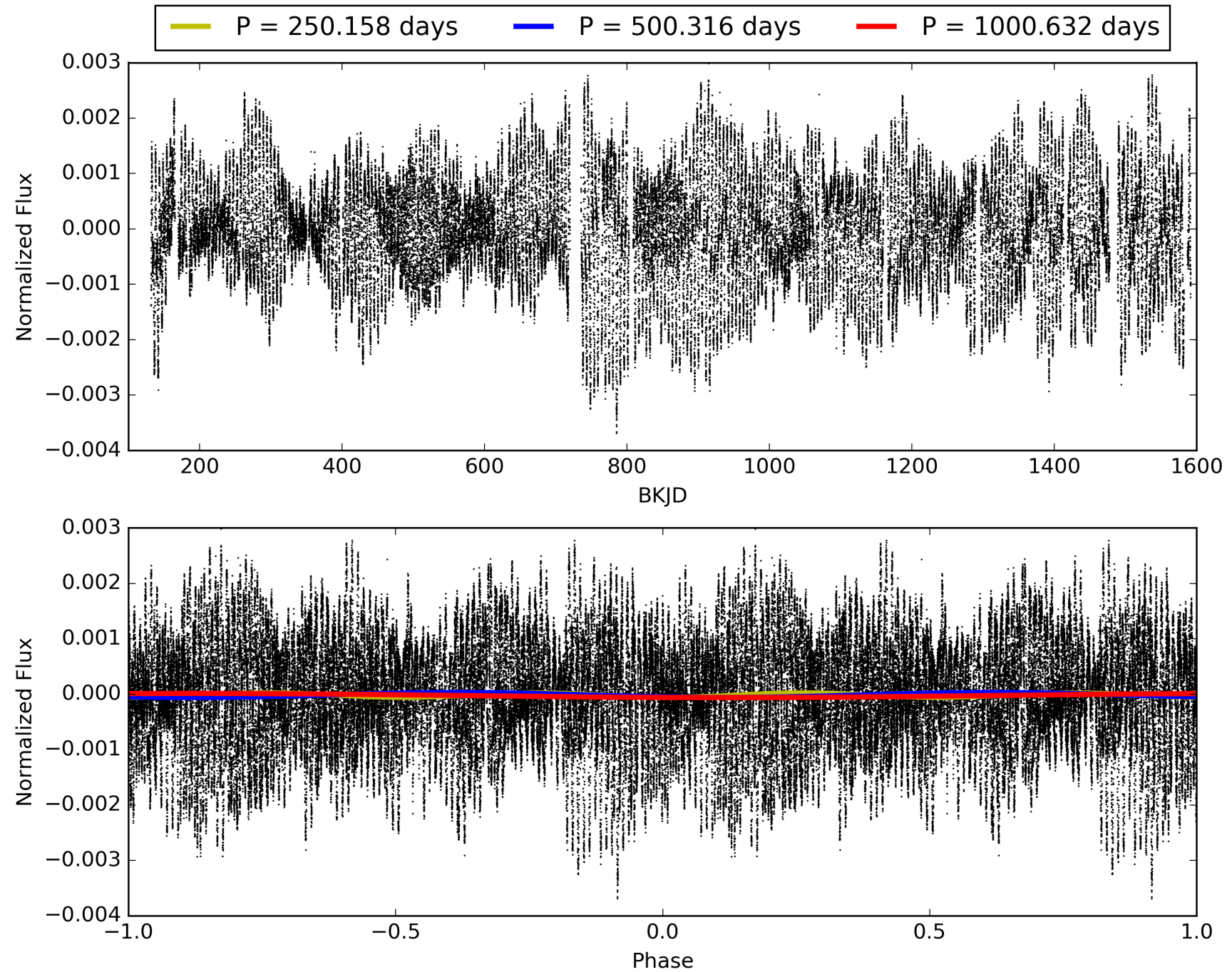
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:21:47 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-02, PDC Light Curves

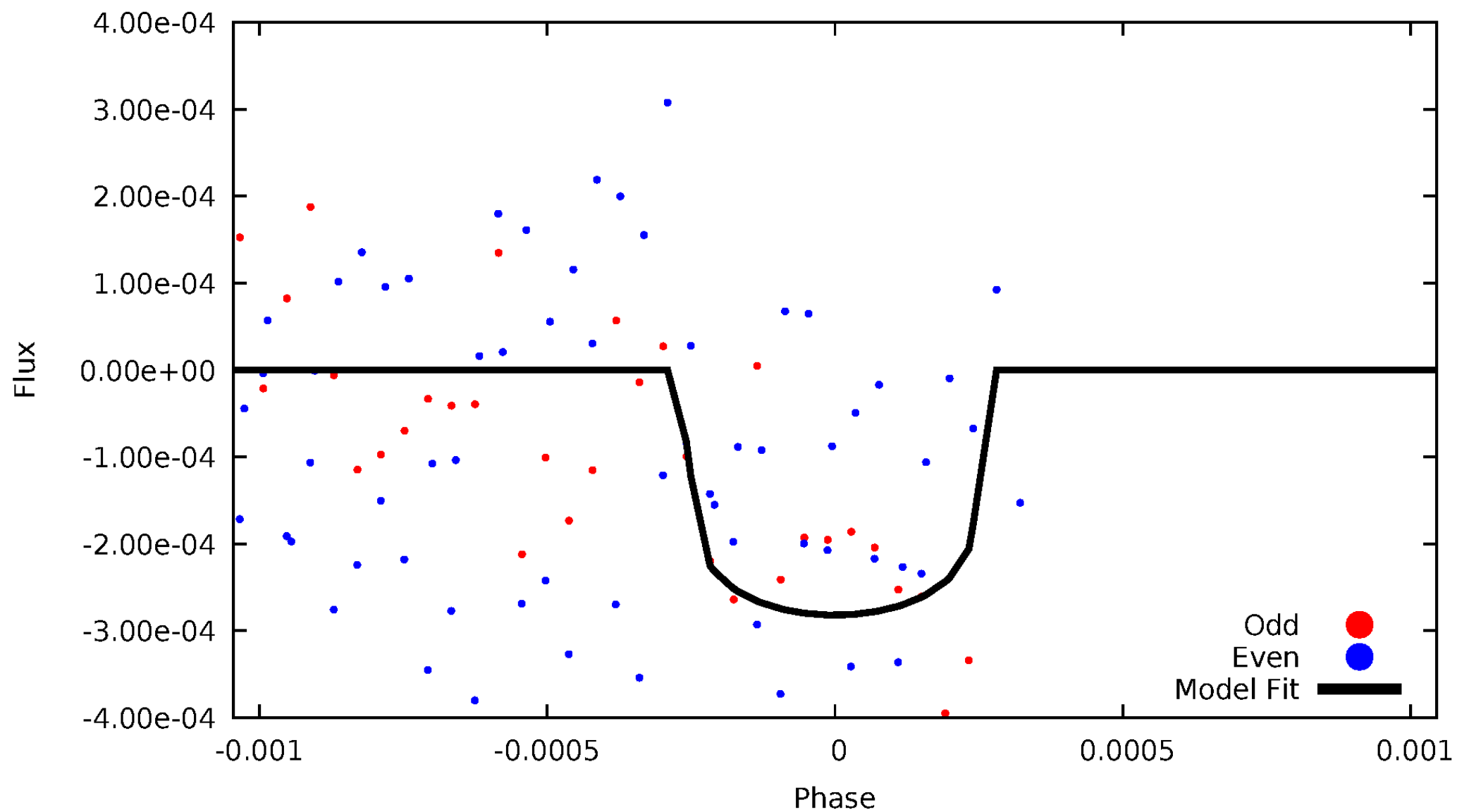


TCE 012457978-02



DV Odd/Even

TCE 012457978-02

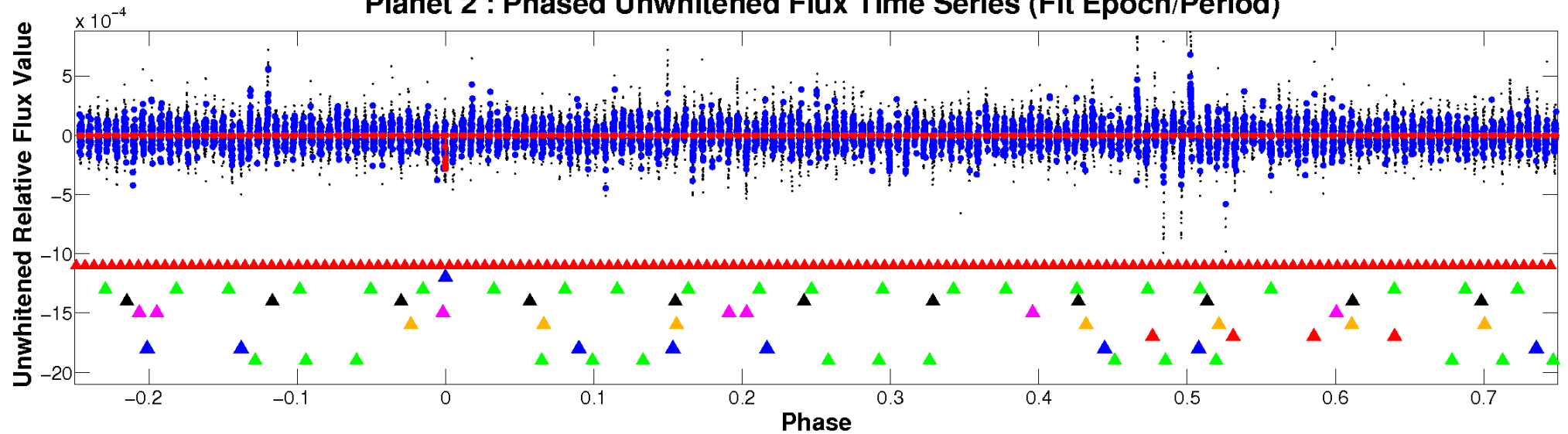


ALT Odd/Even

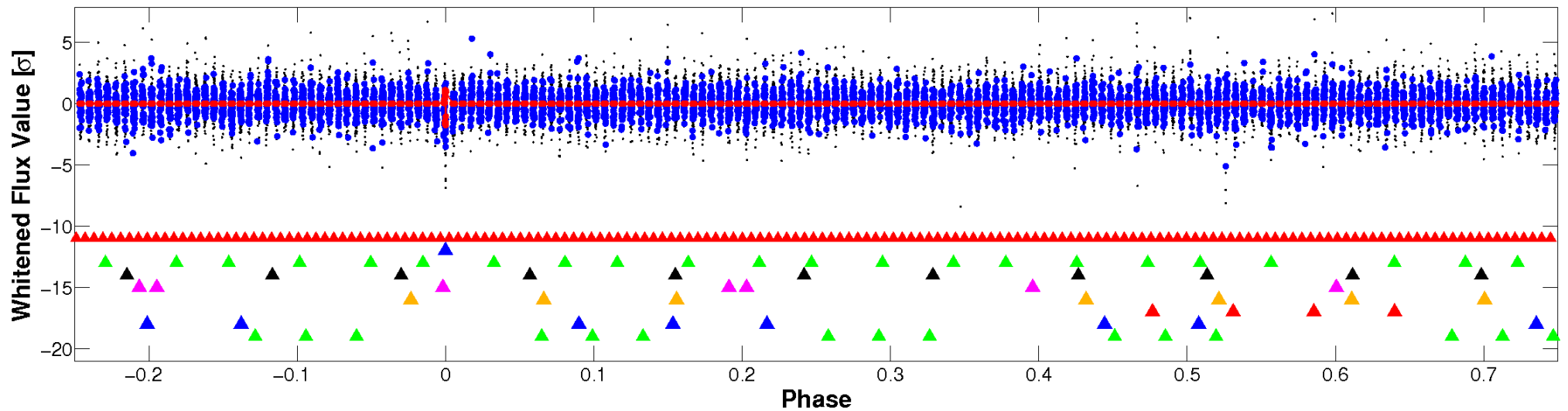
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

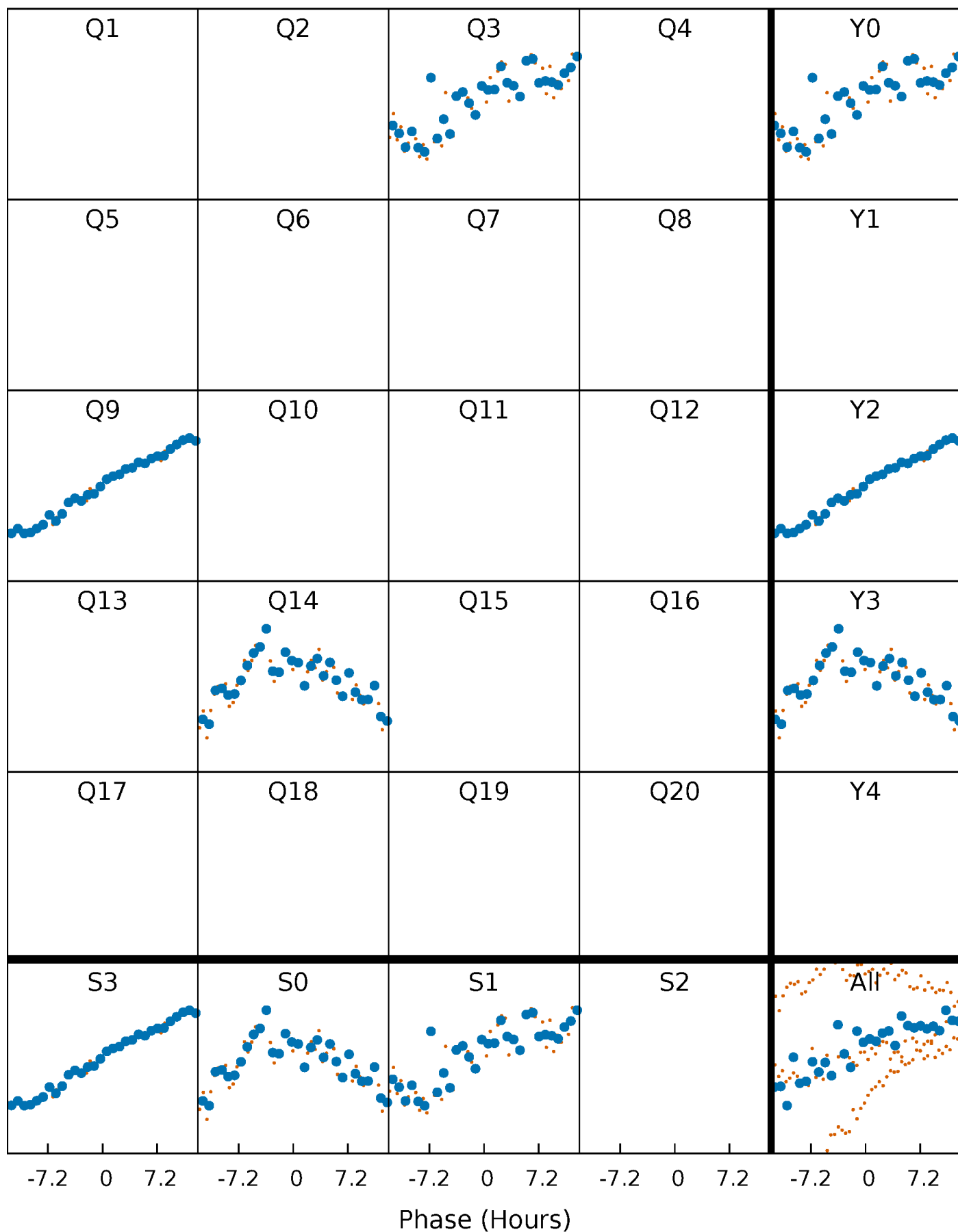


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



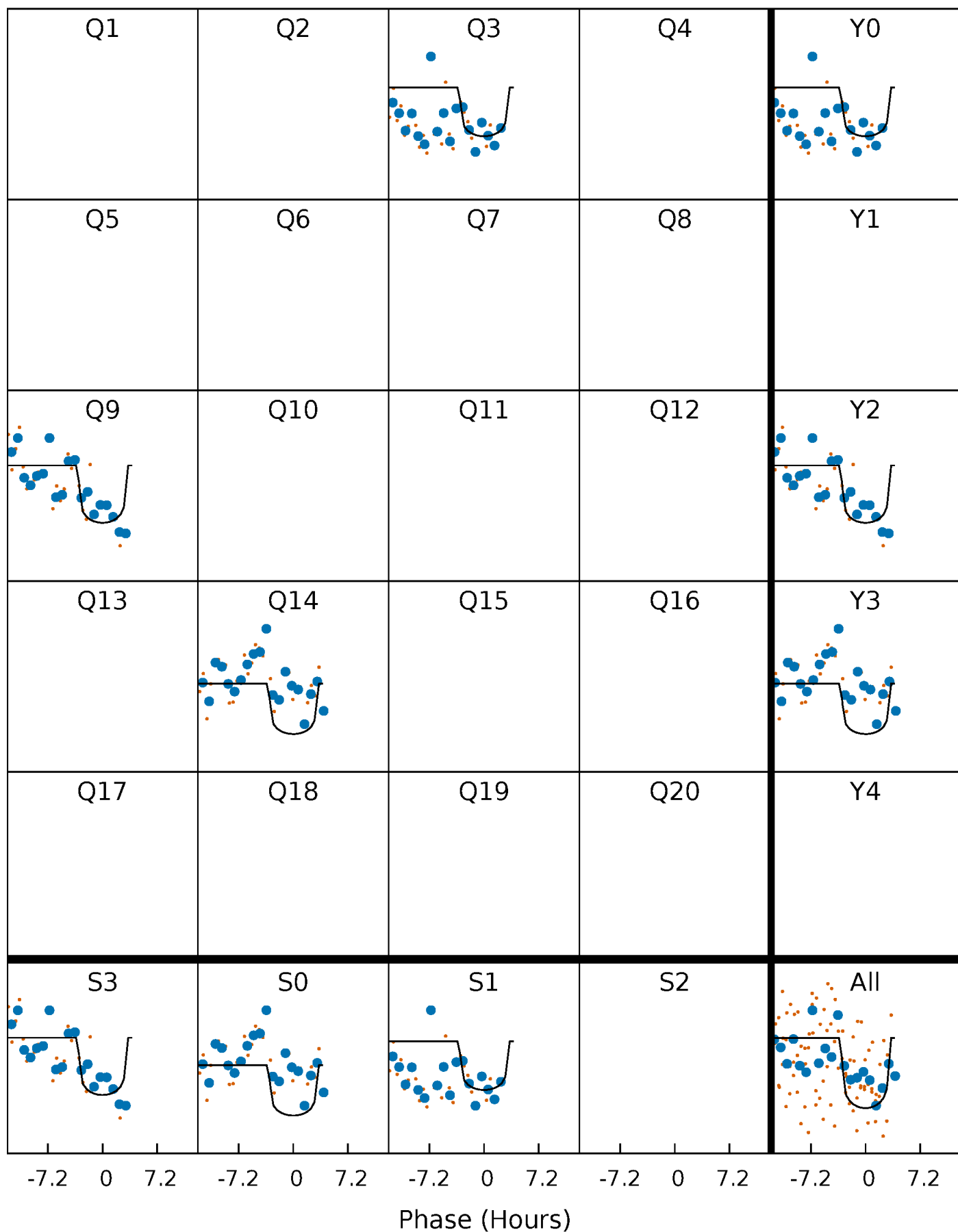
PDC Quarter-Phased Transit Curves

TCE 012457978-02 $P=500.315843$ Days $T_0=327.189906$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012457978-02 $P=500.315843$ Days $T_0=327.189906$ (BKJD)

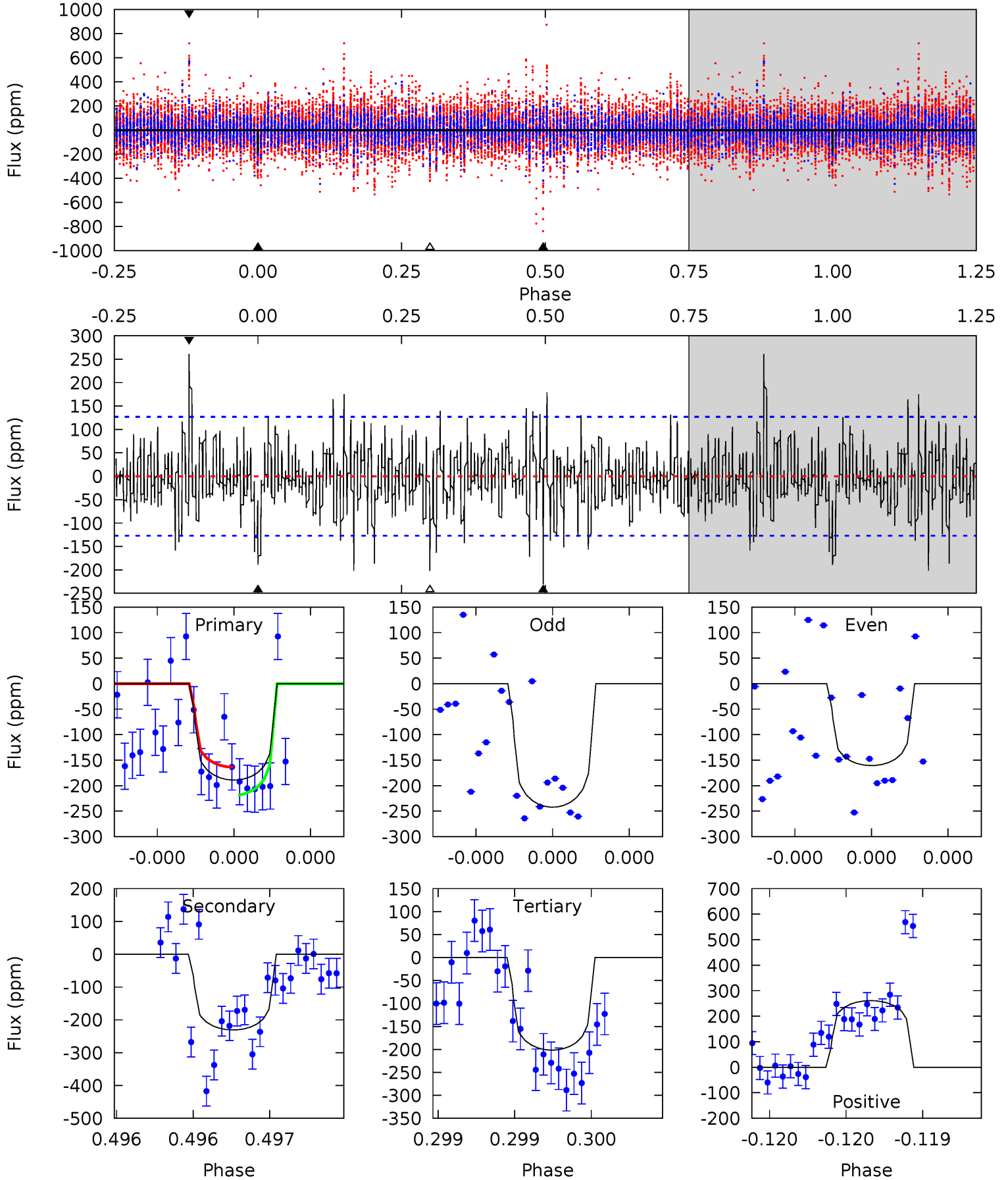


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

012457978-02, P = 500.315843 Days, E = 327.189906 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.29	10.1	8.84	11.4	5.57	3.48	2.35	-0.55	-3.16	1.27	-1.33	1.63	0.79	0.53	1.19



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-231 ± 23	$9.03^{+9.80}_{-6.15}$	569^{+37}_{-50}	4787^{+3644}_{-1113}	3404^{+29966}_{-2649}
Alt.	N/A	N/A	N/A	N/A	N/A

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

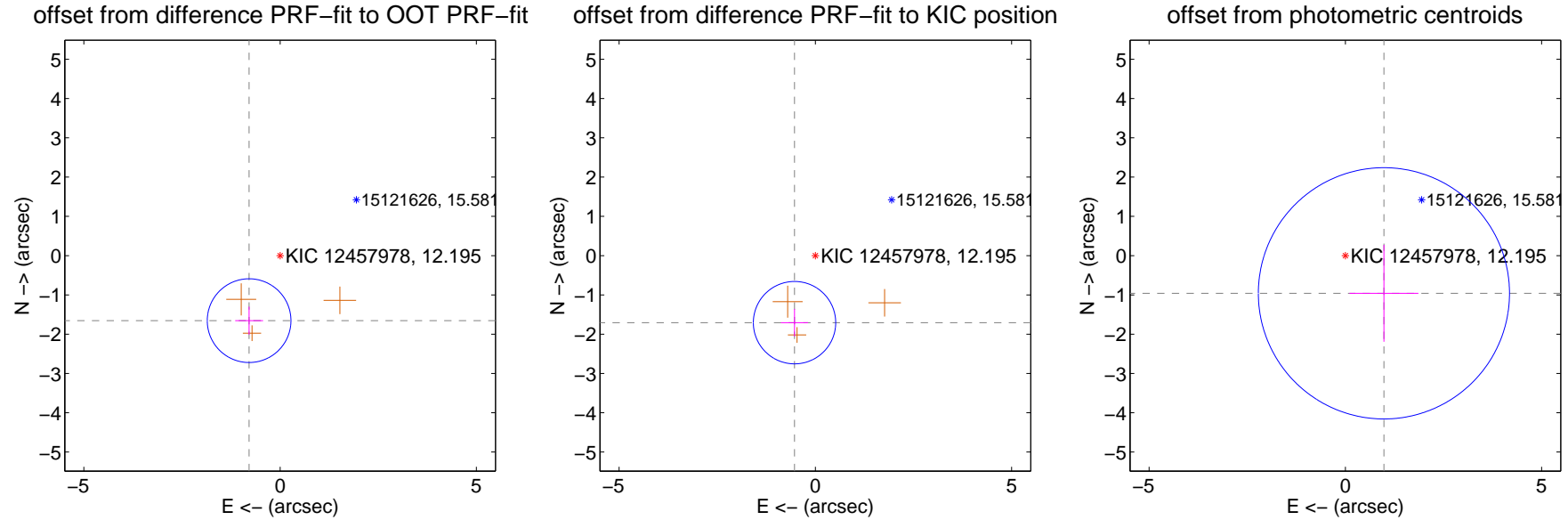
DV Centroid Data

Supplemental centroid analysis for 012457978-02. Kepler magnitude: 12.20. Transit SNR 10.06

There are 0 quarters with good PRF difference image offsets

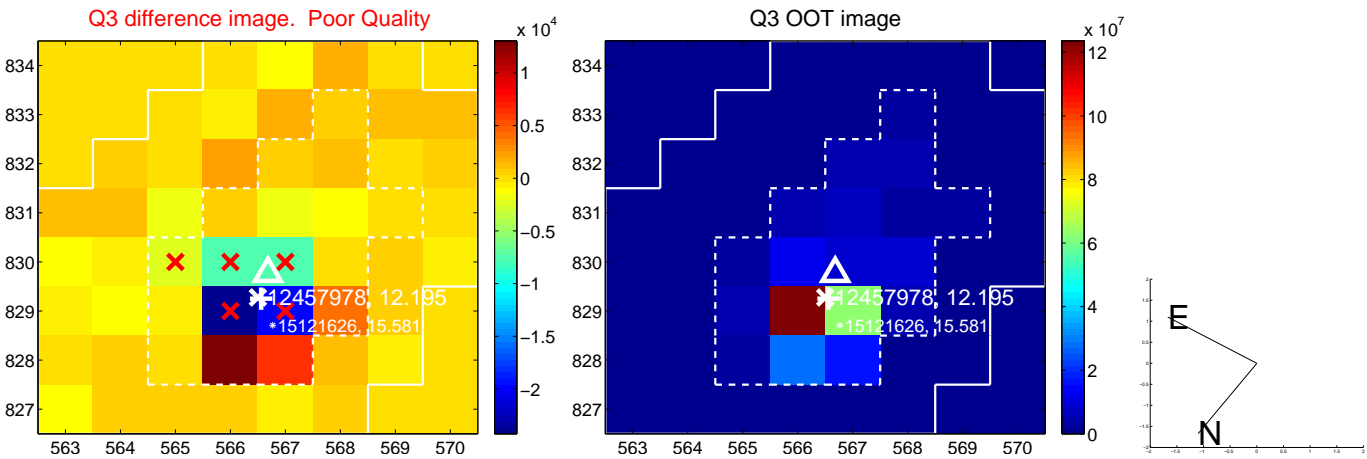
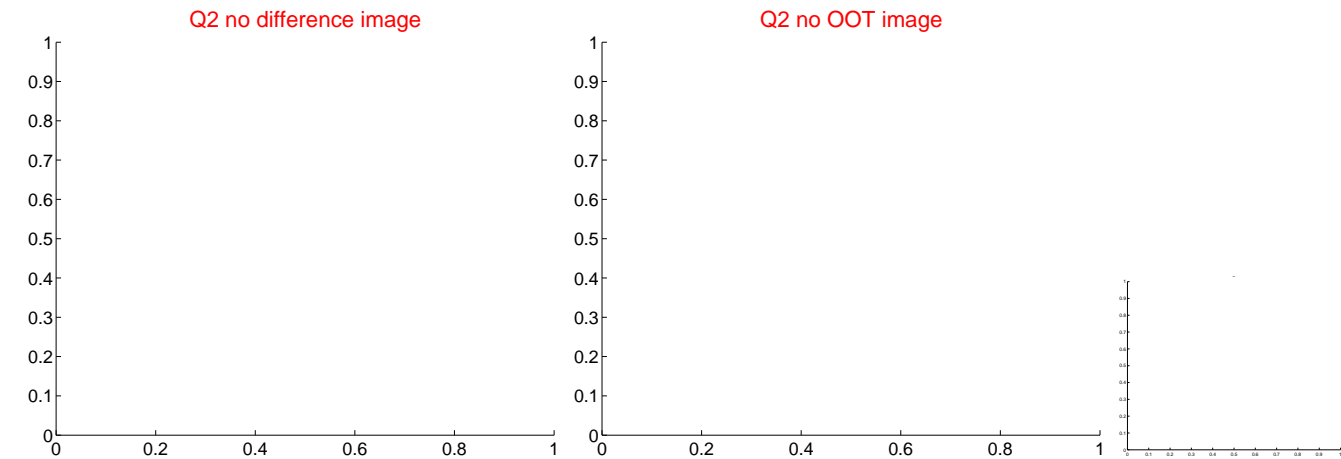
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.834 ± 0.355	5.16	0.790 ± 0.354	-1.655 ± 0.356
PRF-fit source offset from KIC position	1.787 ± 0.350	5.11	0.530 ± 0.345	-1.706 ± 0.350
photometric centroid source offset	1.37 ± 1.07	1.29	-0.98 ± 0.88	-0.96 ± 1.23



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

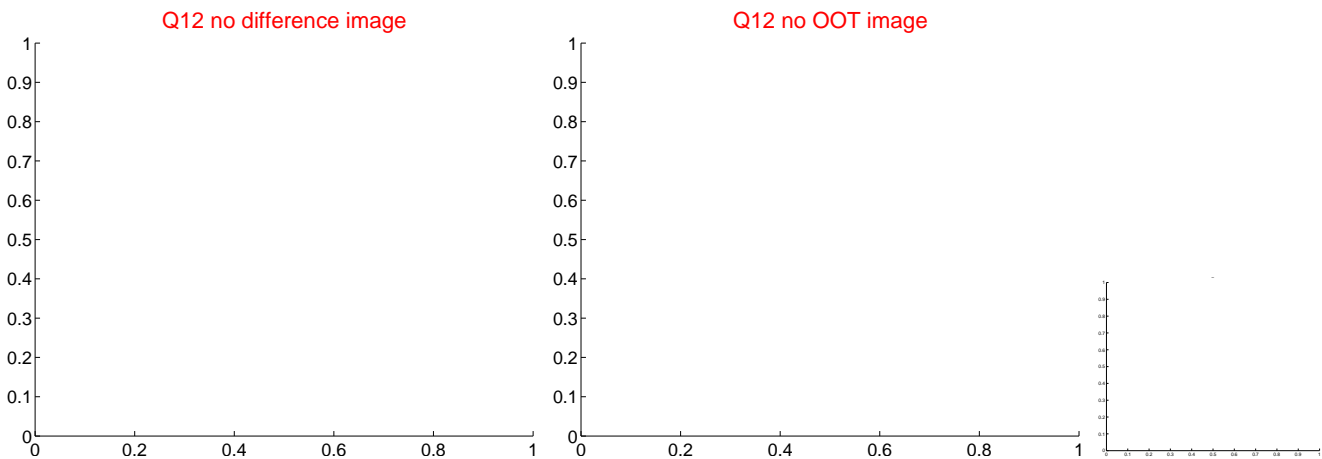
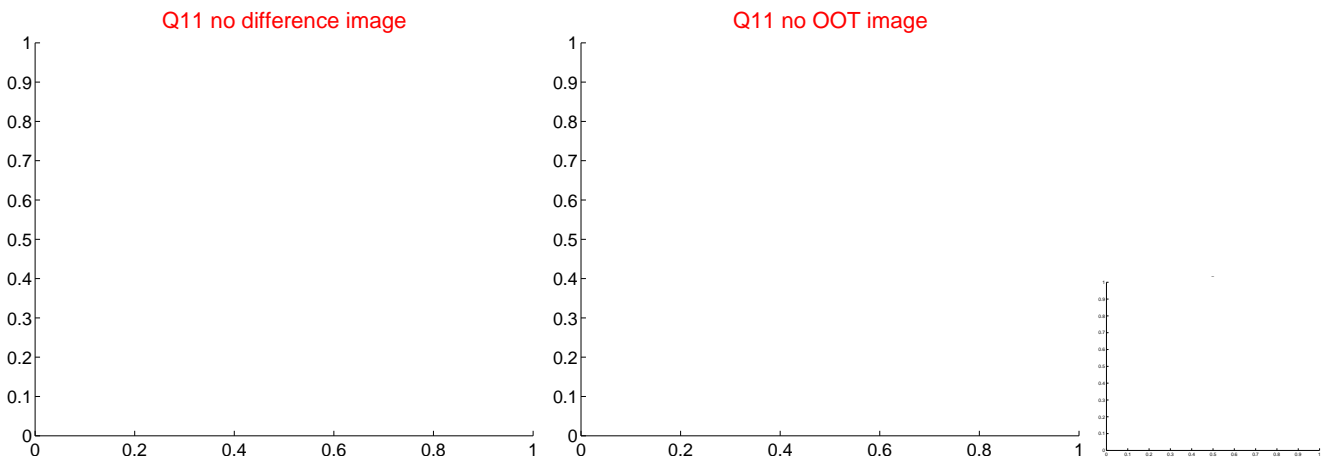
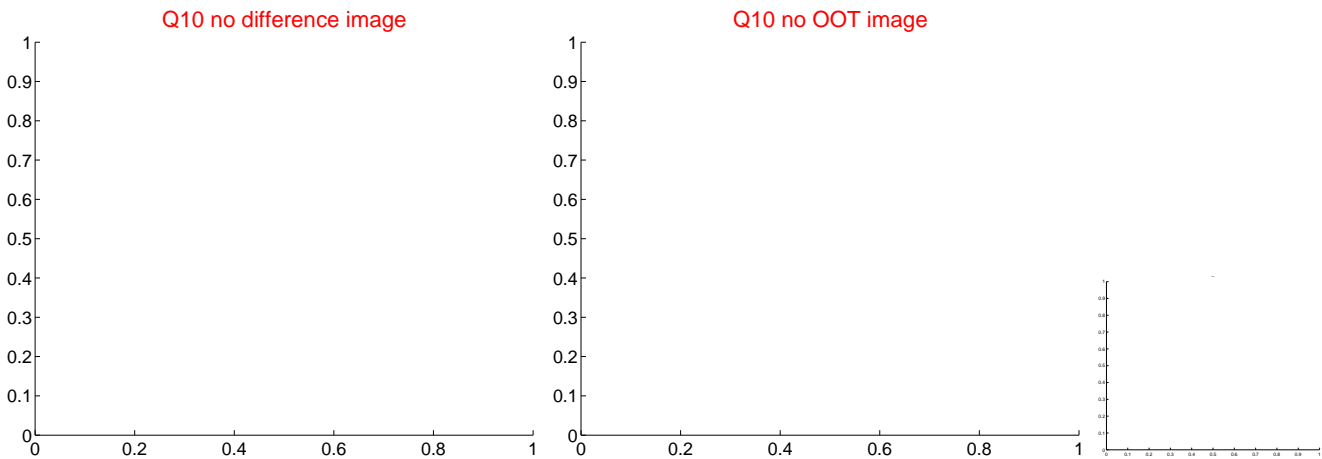
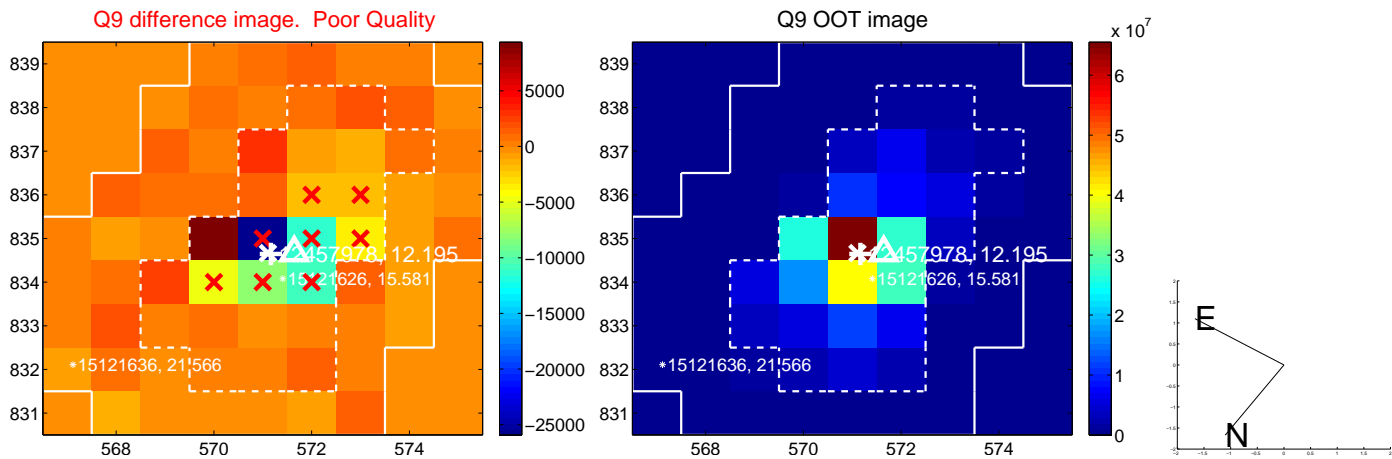
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

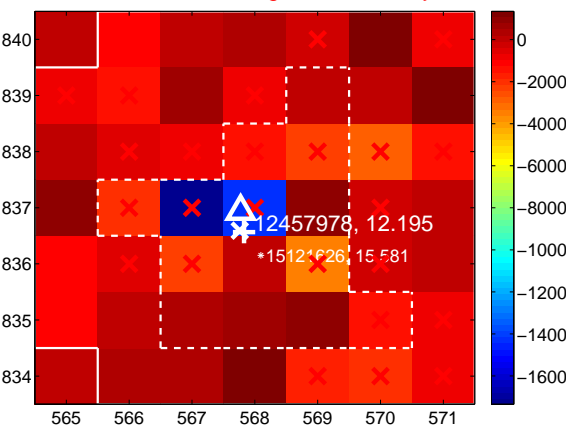
Q13 no difference image



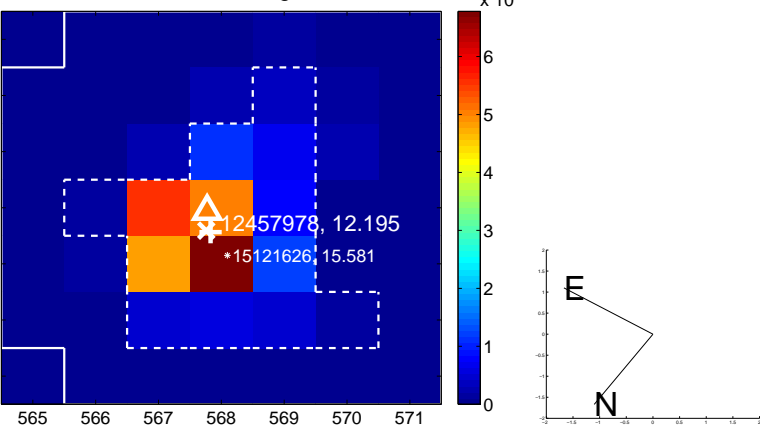
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



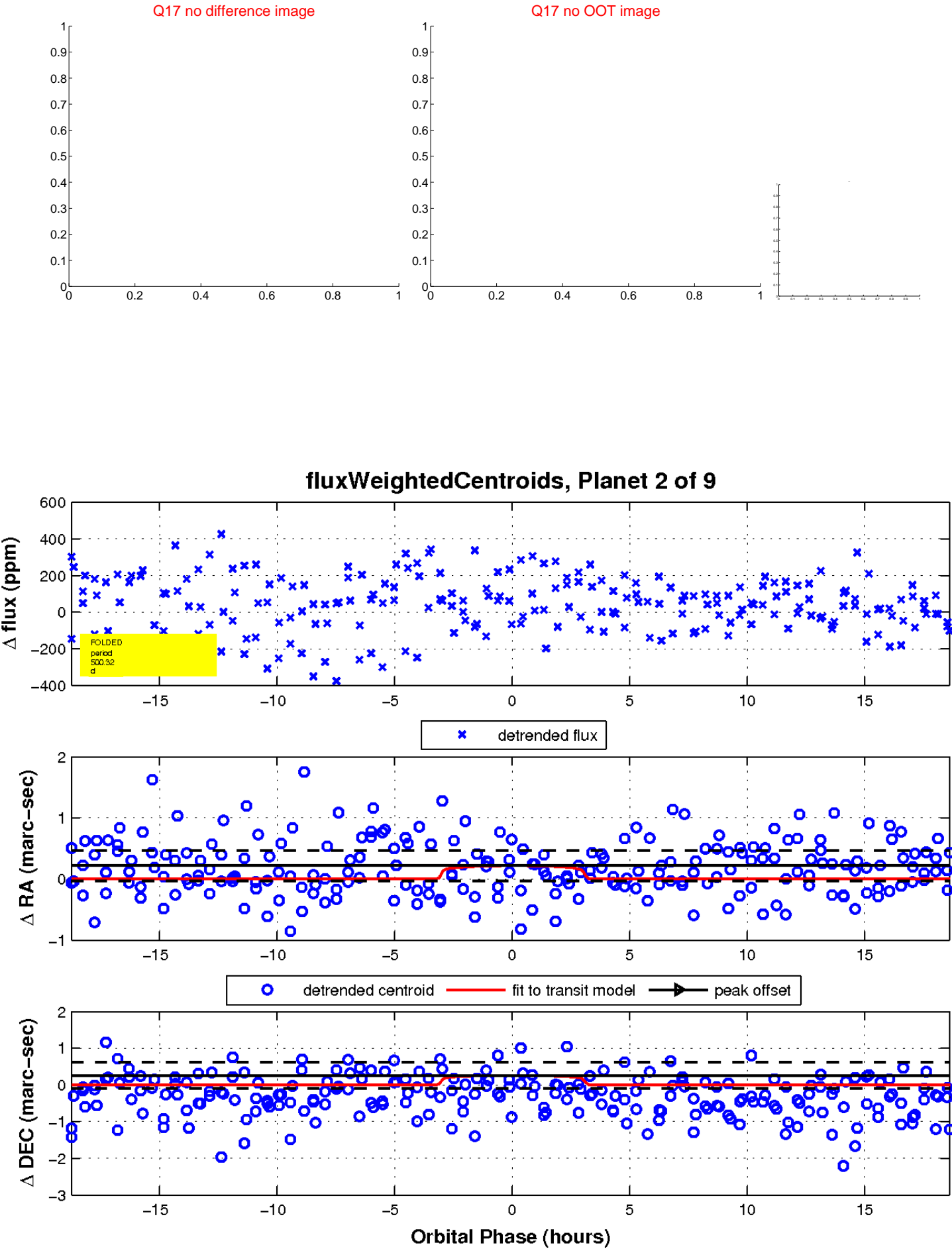
Q16 no difference image



Q16 no OOT image

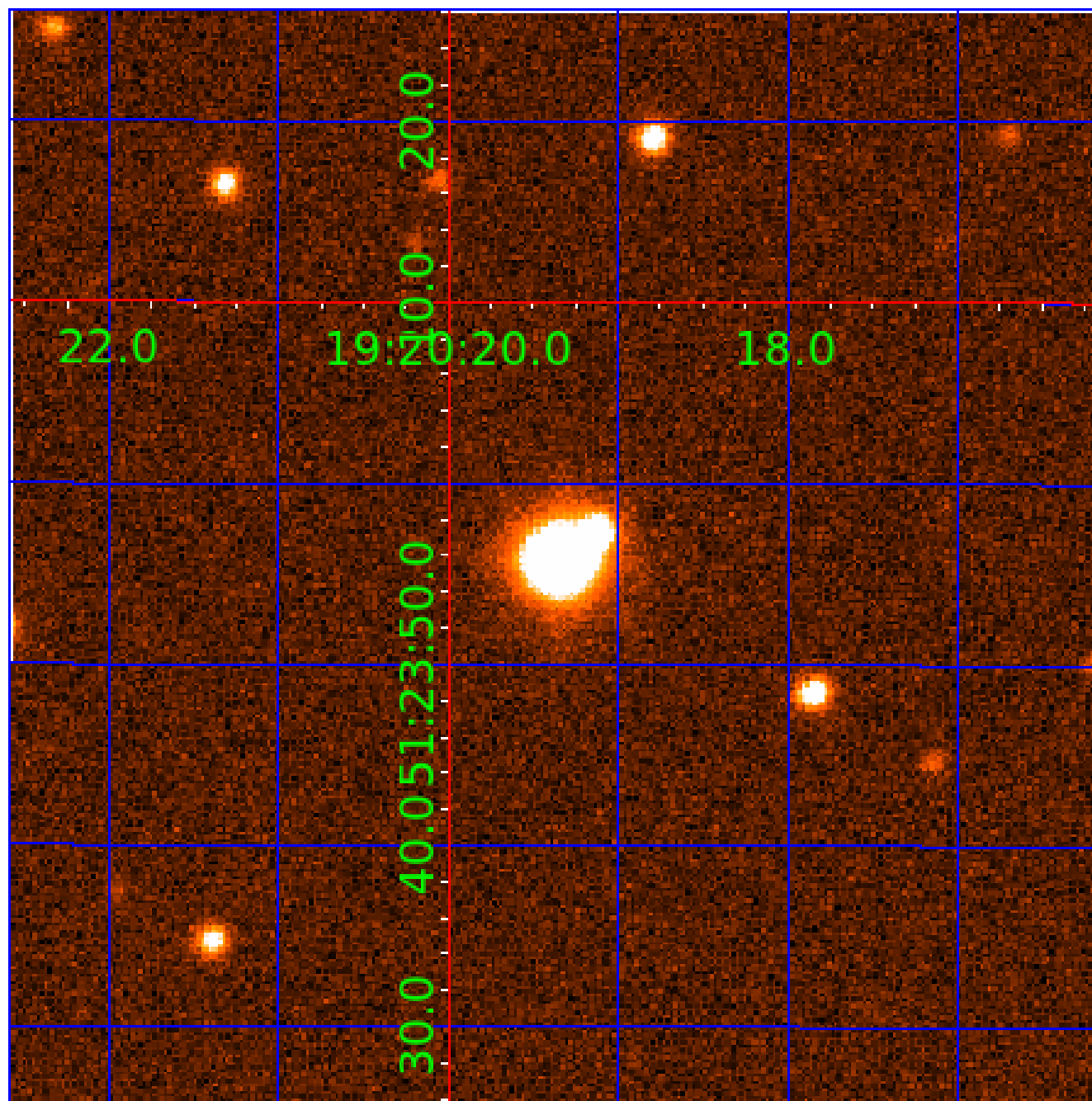


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

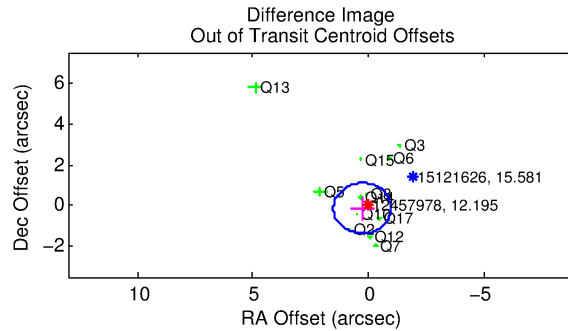
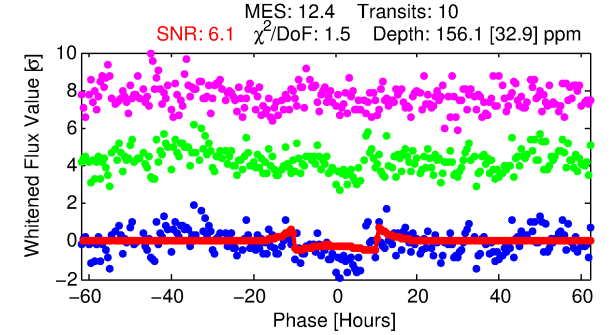
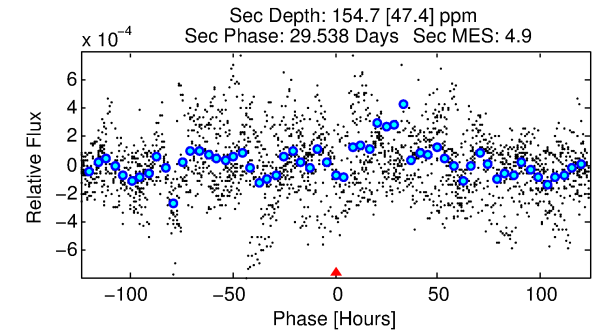
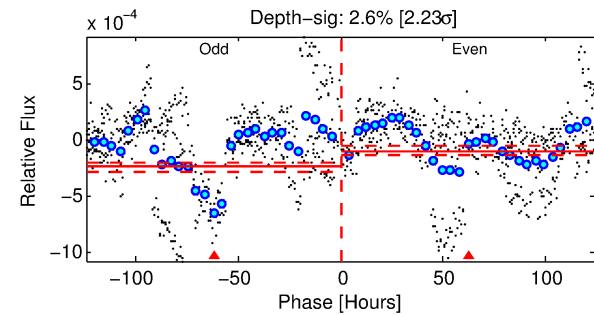
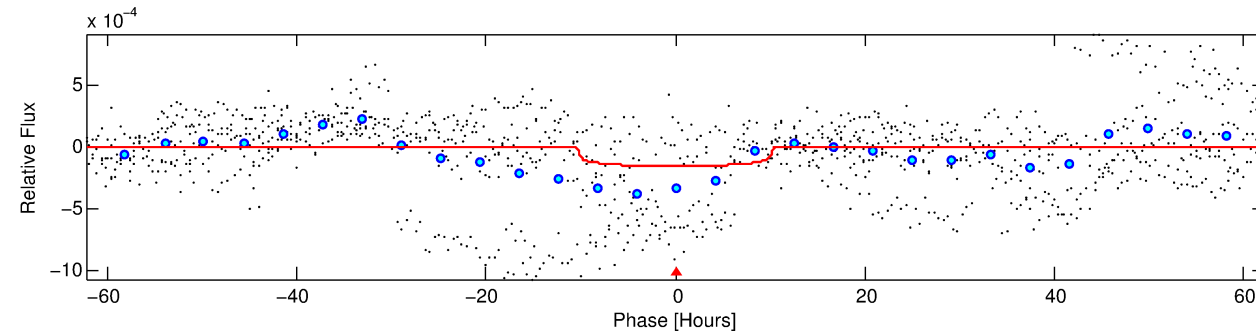
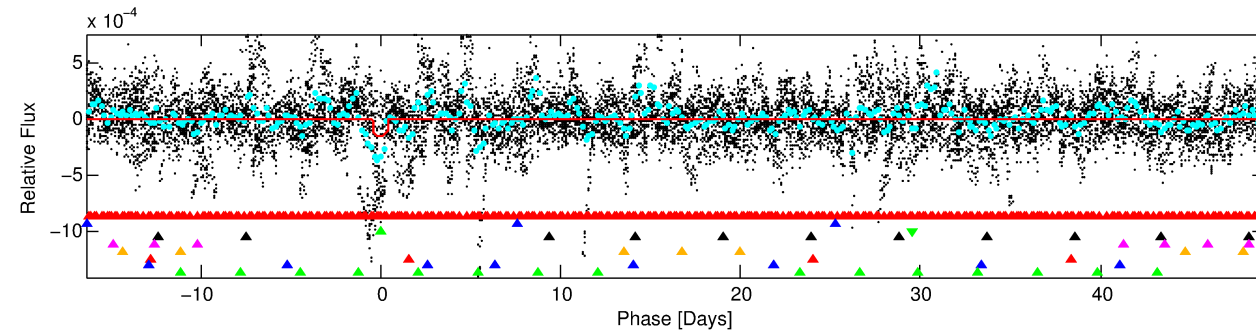
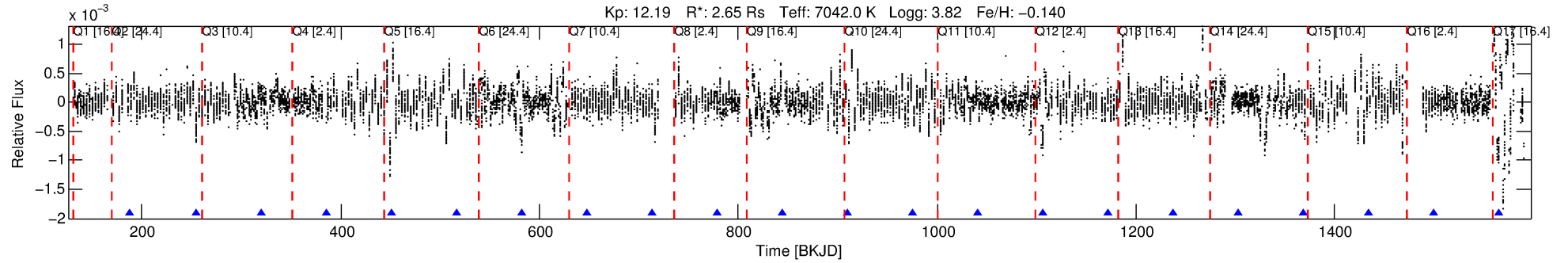
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-03

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 3 of 9 Period: 65.533 d



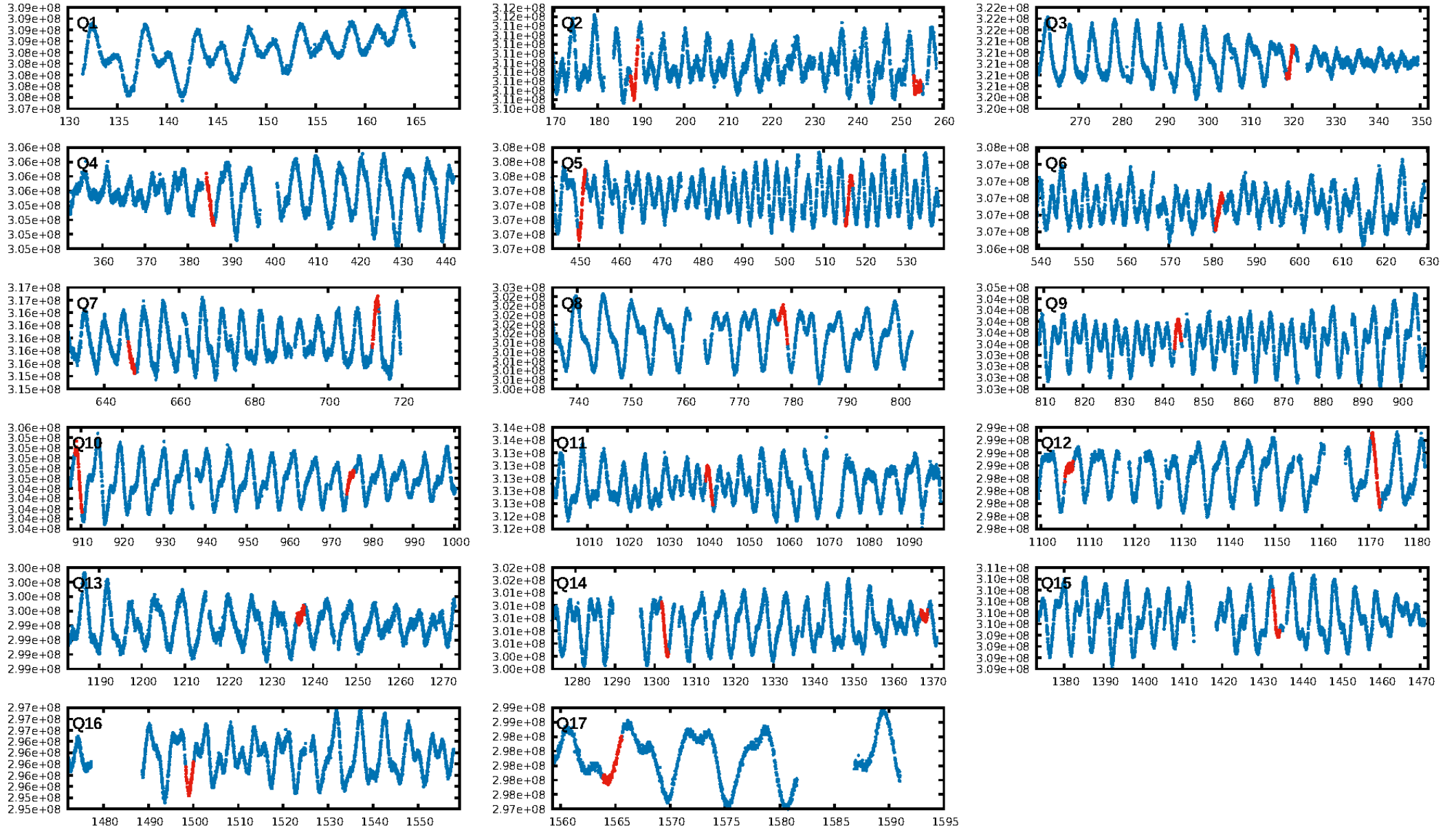
DV Fit Results:

Period = 65.53335 [0.00154] d
Epoch = 188.5273 [0.0172] BKJD
Rp/R* = 0.0119 [0.0050]
a/R* = 20.82 [47.16]
b = 0.53 [3.07]
Seff = 107.34 [55.84]
Teff = 821 [107] K
Rp = 3.44 [1.92] Re
a = 0.3799 [0.1246] AU
Ag = 1037.09 [1063.45] [0.97σ]
Teffp = 7201 [1630] K [3.91σ]

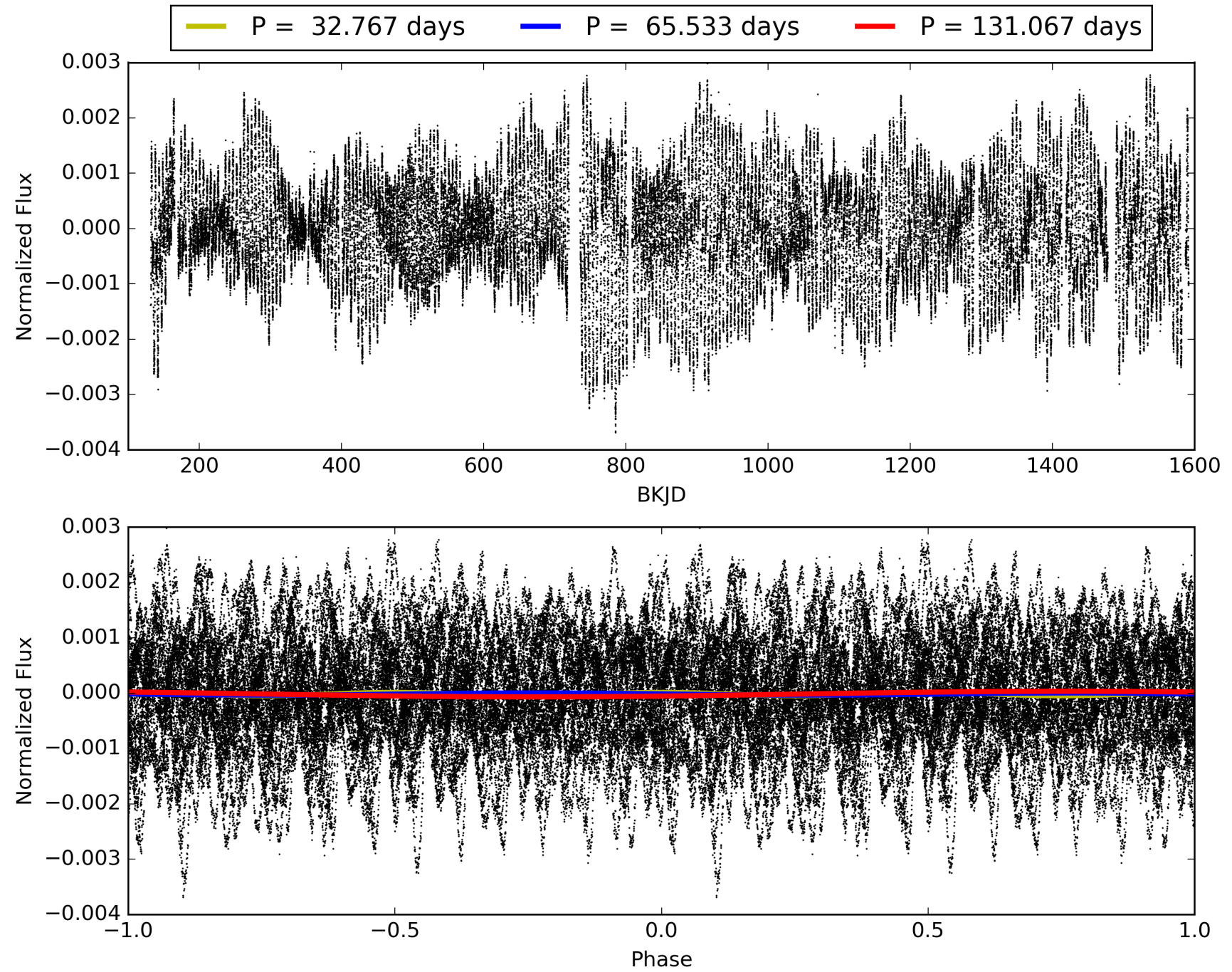
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.39σ]
LongPeriod-sig: 100.0% [34.15σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.05e-12
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 3.632
Centroid-sig: 10.6%
Centroid-so: 0.814 arcsec [1.66σ]
OotOffset-rm: 0.318 arcsec [0.77σ]
KicOffset-rm: 0.175 arcsec [0.33σ]
OotOffset-st: 4/3/2/3 [12]
KicOffset-st: 4/3/2/3 [12]
DiffImageQuality-fgm: 0.42 [5/12]
DiffImageOverlap-fno: 0.00 [0/12]

TCE 012457978-03, PDC Light Curves

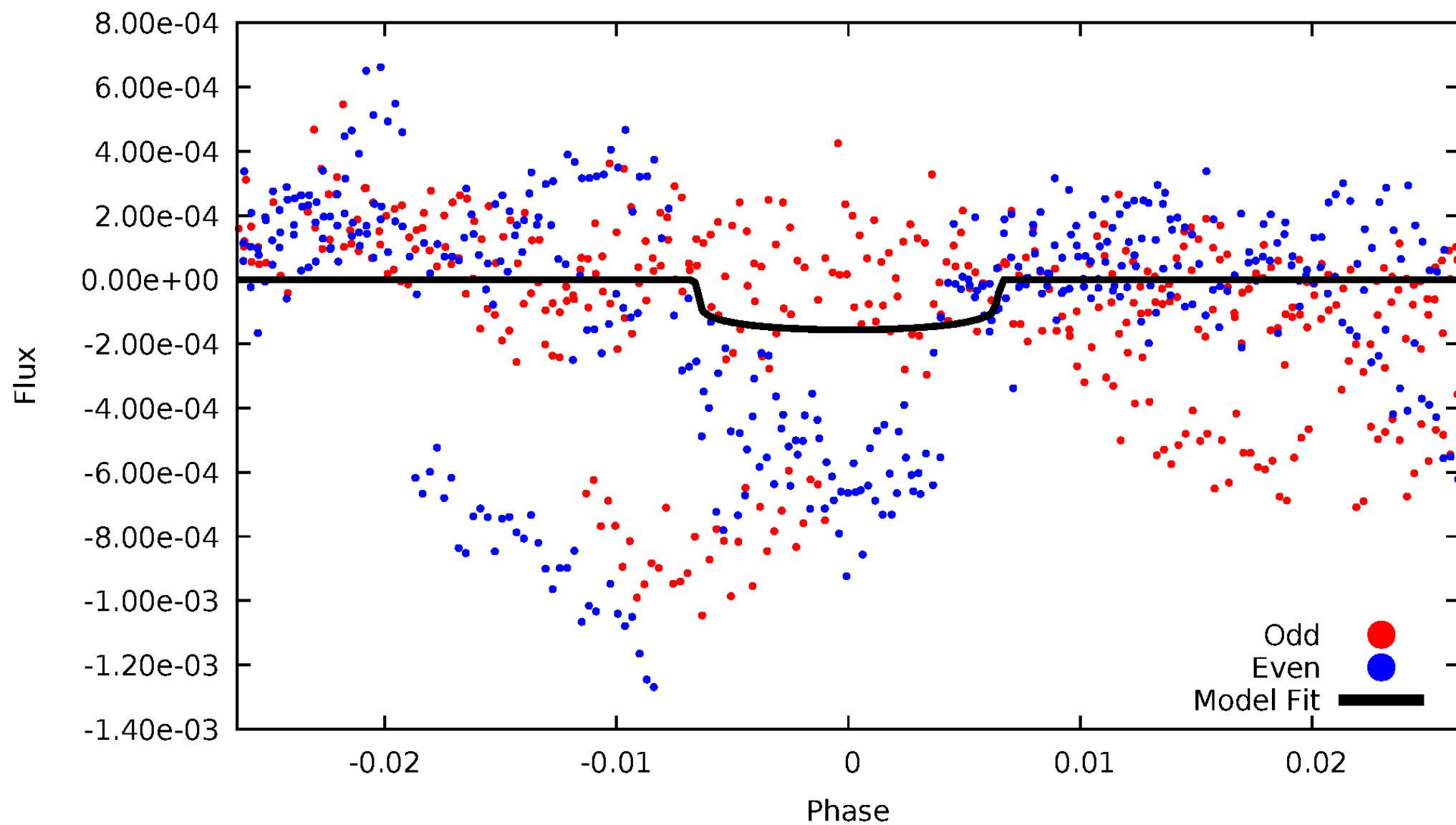


TCE 012457978-03



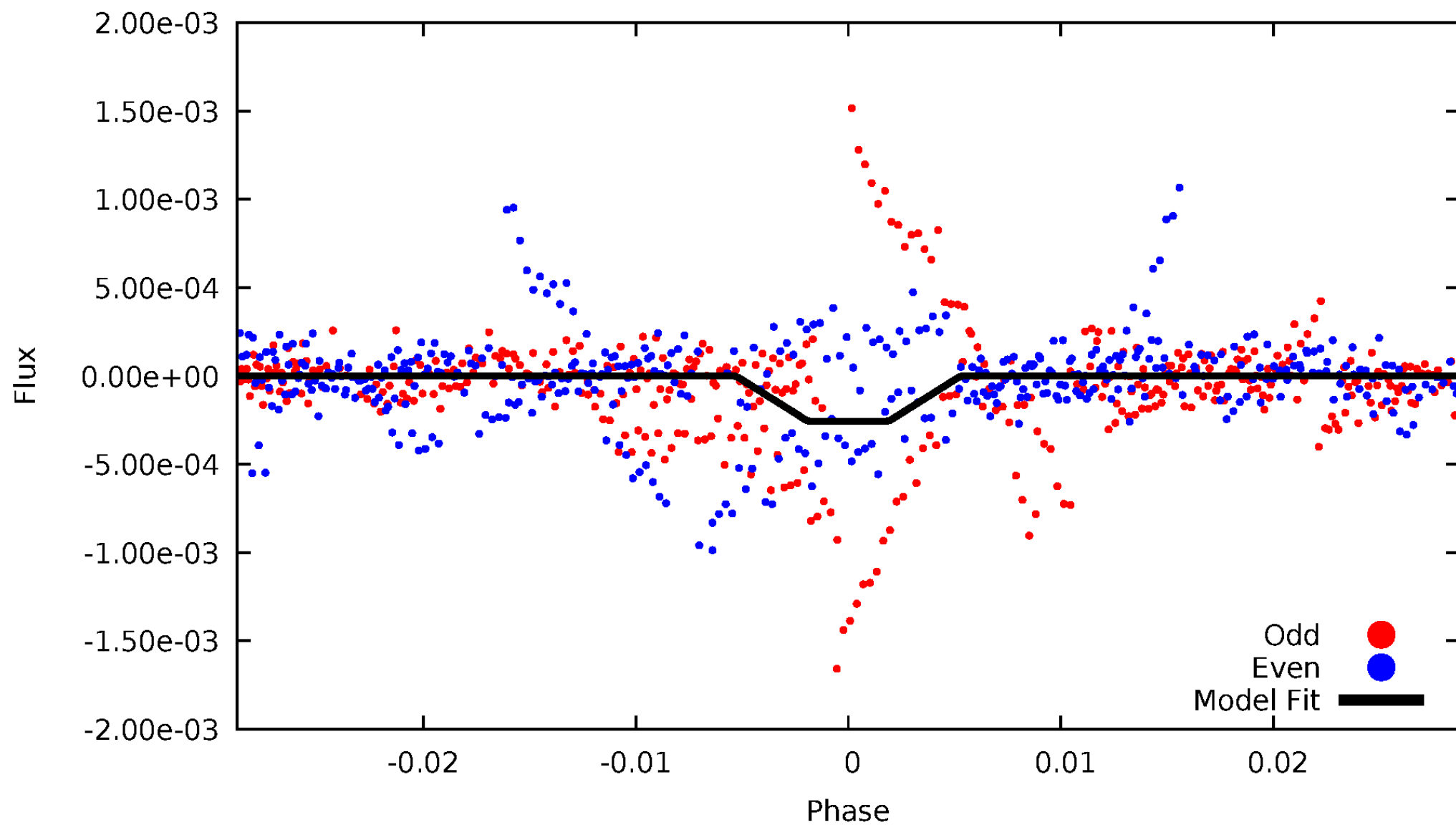
DV Odd/Even

TCE 012457978-03

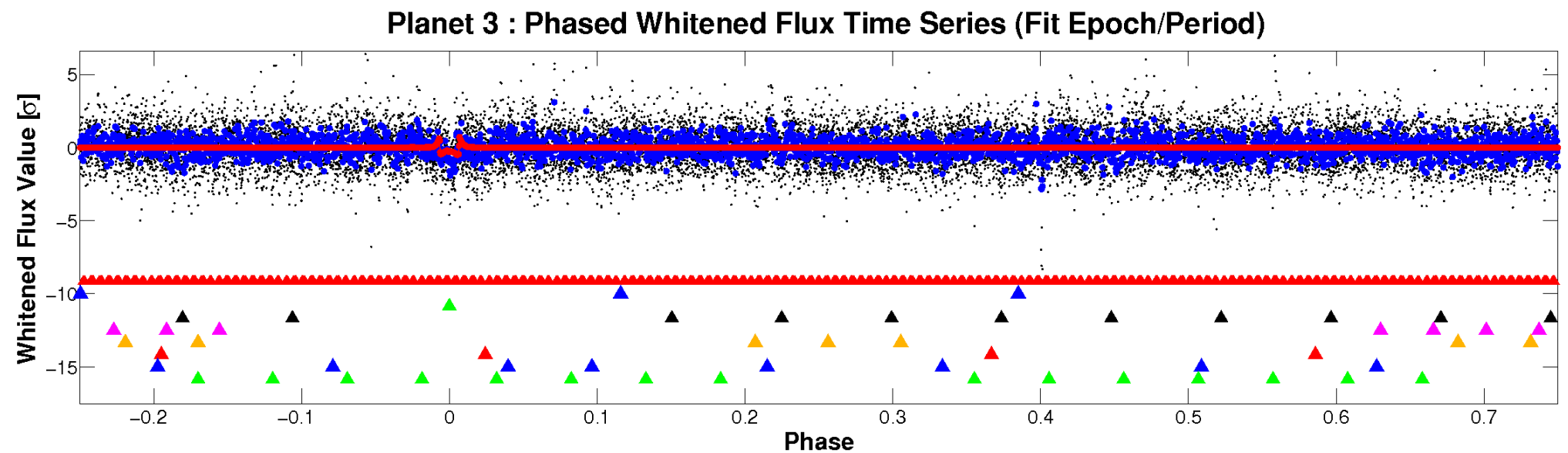
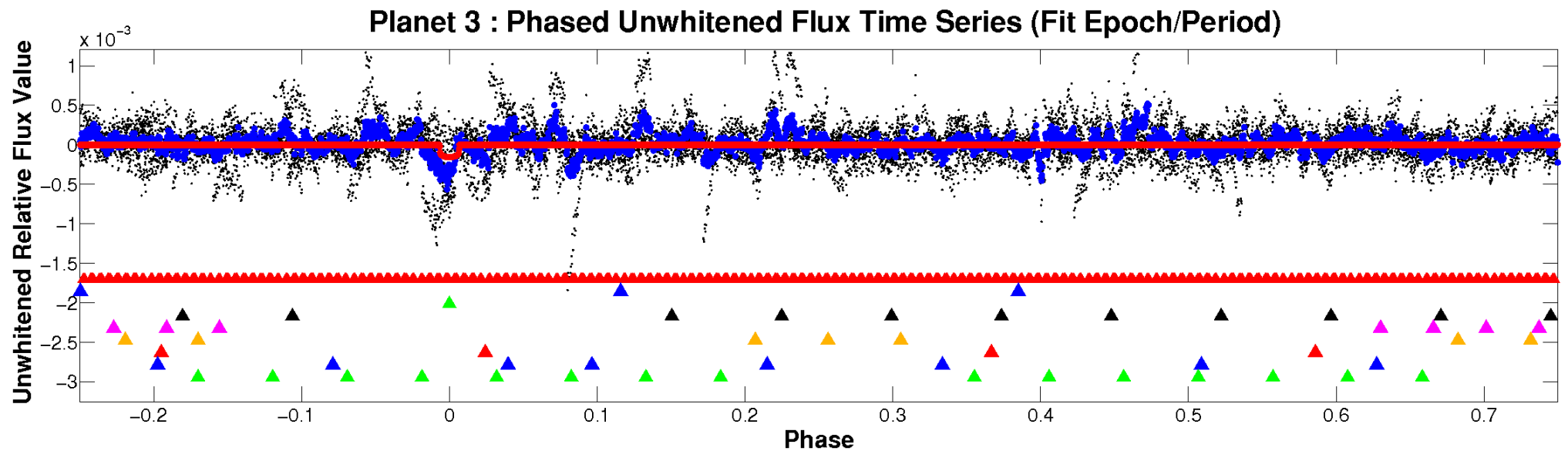


ALT Odd/Even

TCE 012457978-03

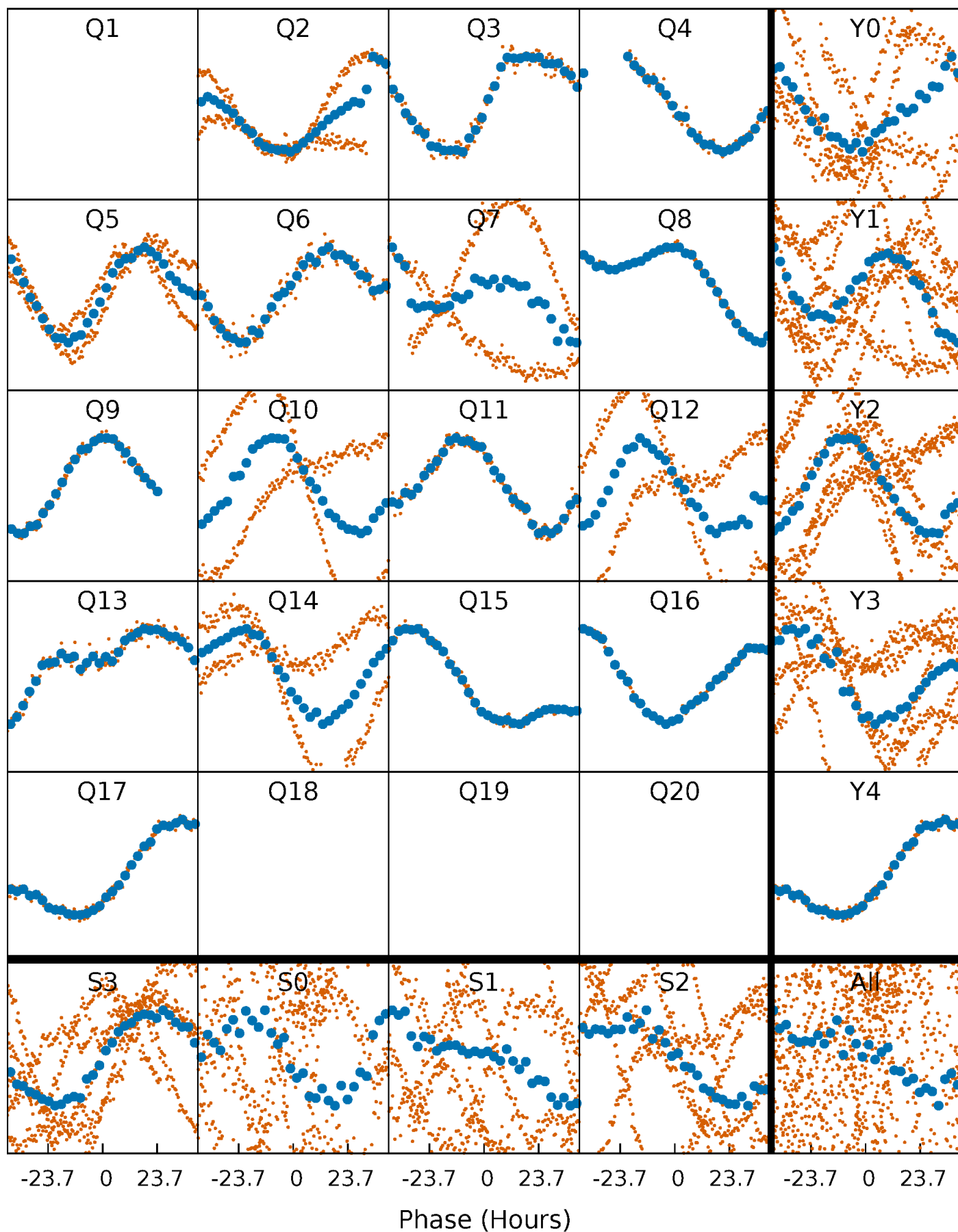


Non-Whitened Vs. Whitened Light Curve



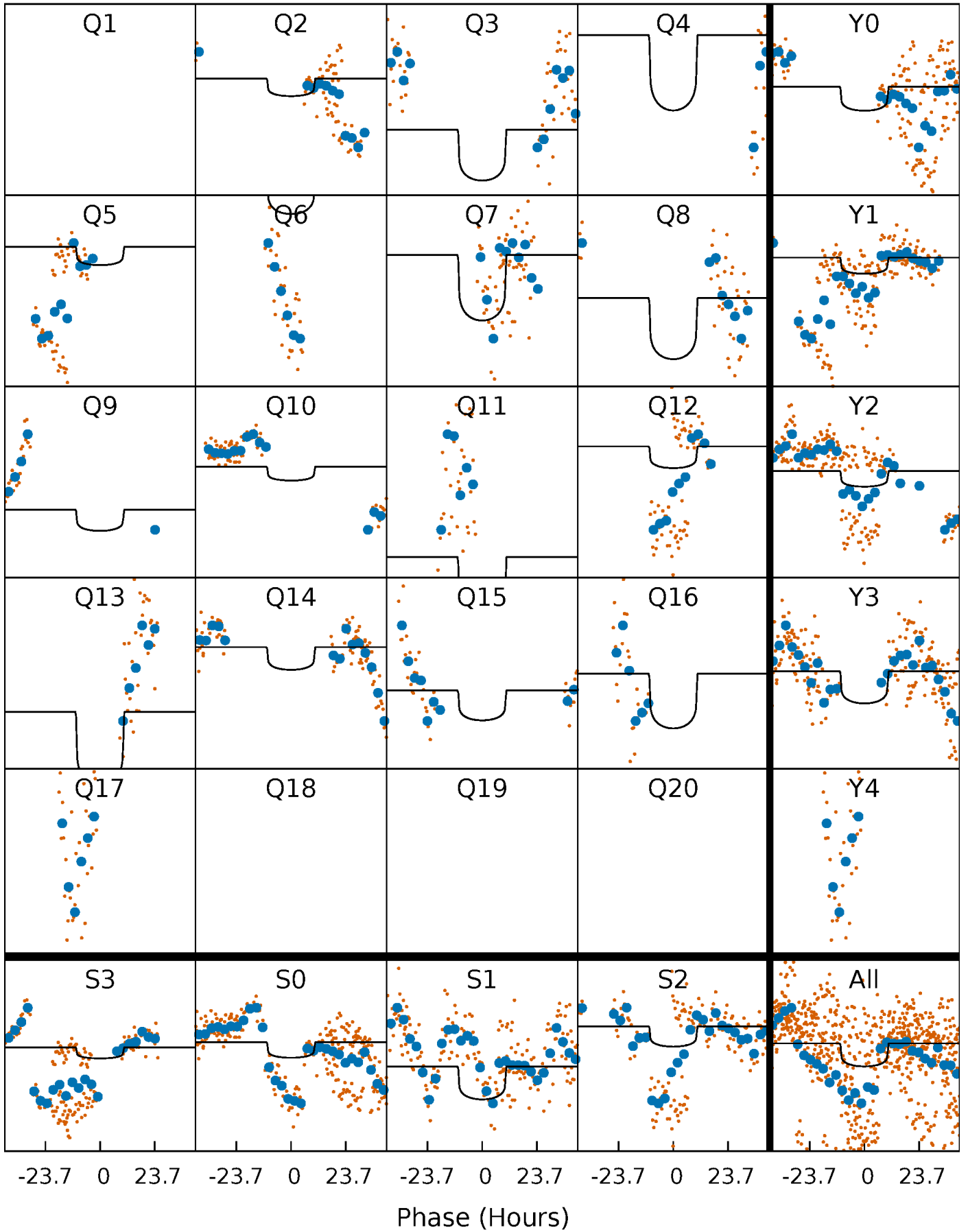
PDC Quarter-Phased Transit Curves

TCE 012457978-03 P= 65.533353 Days $T_0=188.527270$ (BKJD)



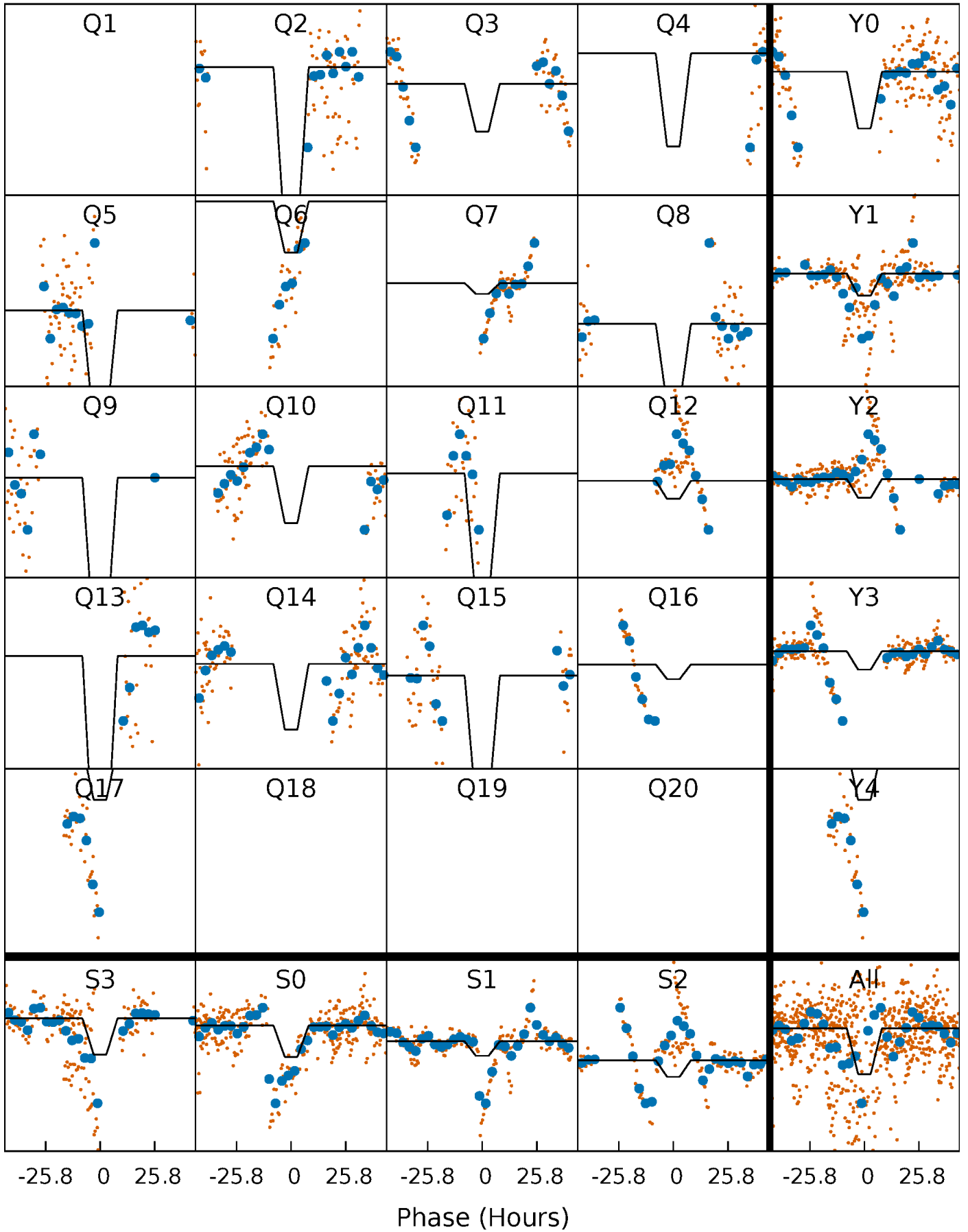
DV Quarter-Phased Transit Curves

TCE 012457978-03 P= 65.533353 Days $T_0=188.527270$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

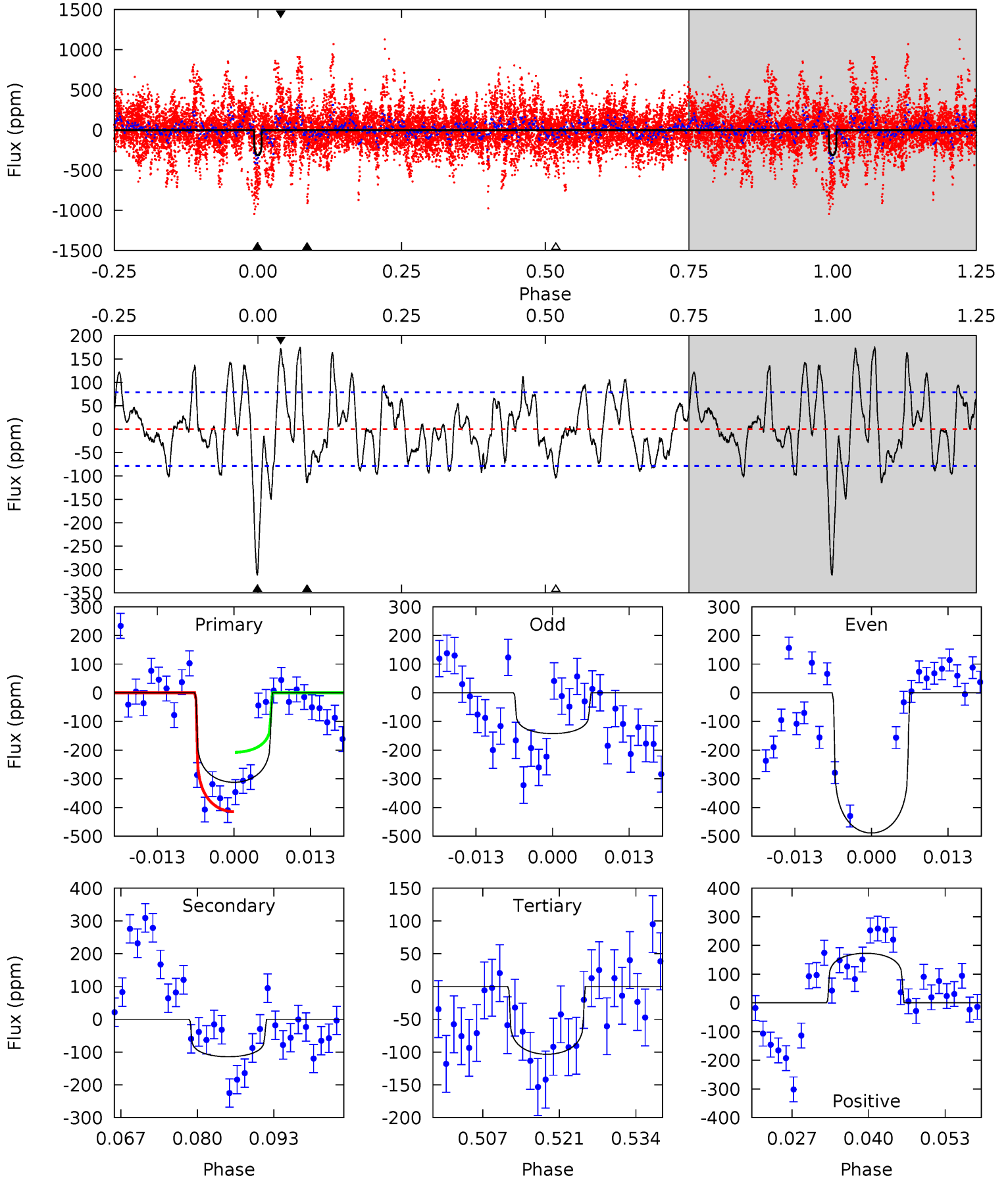
TCE 012457978-03 P= 65.534682 Days $T_0=188.467755$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-03, P = 65.533353 Days, E = 122.993917 Days

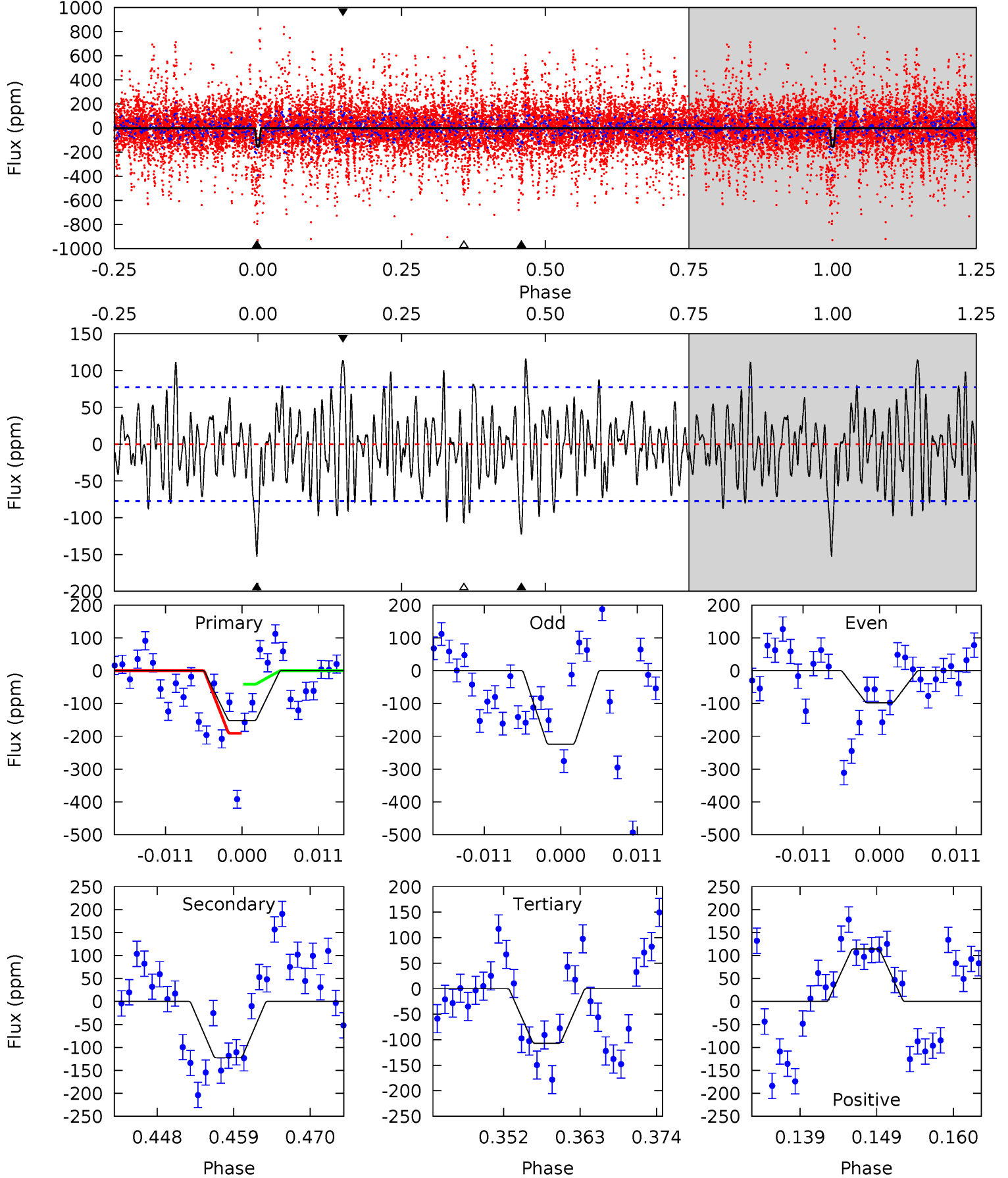
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	7.23	6.54	10.9	4.97	2.47	3.71	13.2	8.80	0.69	-3.71	10.6	2.14	0.36	6.57



Alt Model-Shift Uniqueness Test

012457978-03, P = 65.534682 Days, E = 122.933073 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.90	7.95	6.92	7.40	5.01	2.55	2.52	2.97	2.50	1.03	0.56	3.75	1.45	0.43	4.75



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-114±16	$3.30^{+1.48}_{-1.40}$	1130^{+64}_{-99}	6536^{+2437}_{-1018}	835^{+1685}_{-439}
Alt.	-123±15	$4.35^{+1.63}_{-1.51}$	1122^{+67}_{-104}	5792^{+1193}_{-730}	509^{+653}_{-240}

T_{max} = Theoretical Maximum Planetary Temperature
 T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
 A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

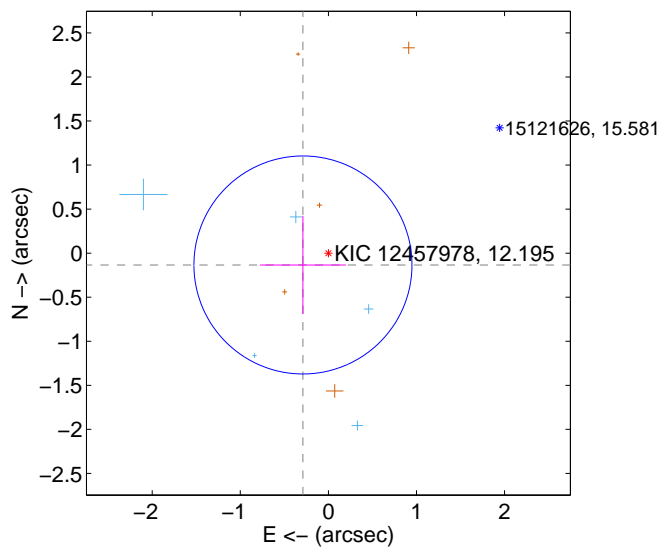
Supplemental centroid analysis for 012457978-03. Kepler magnitude: 12.20. Transit SNR 6.12

There are 5 quarters with good PRF difference image offsets

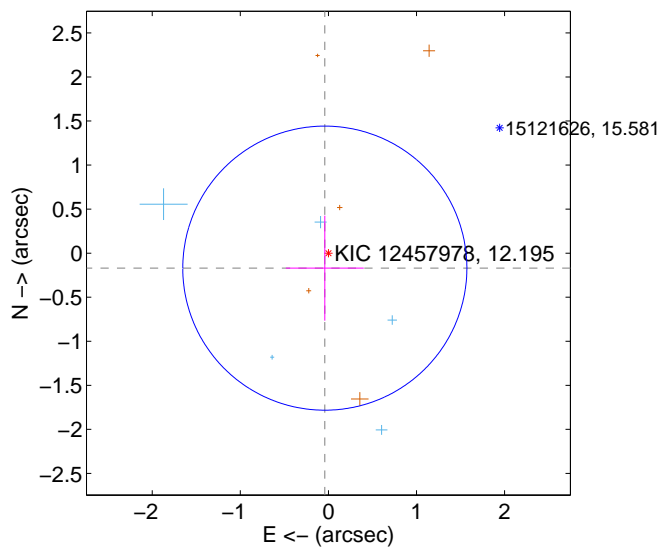
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.318 ± 0.412	0.77	0.289 ± 0.487	-0.134 ± 0.557
PRF-fit source offset from KIC position	0.175 ± 0.537	0.33	0.041 ± 0.442	-0.170 ± 0.595
photometric centroid source offset	0.81 ± 0.49	1.66	-0.57 ± 0.40	-0.58 ± 0.57

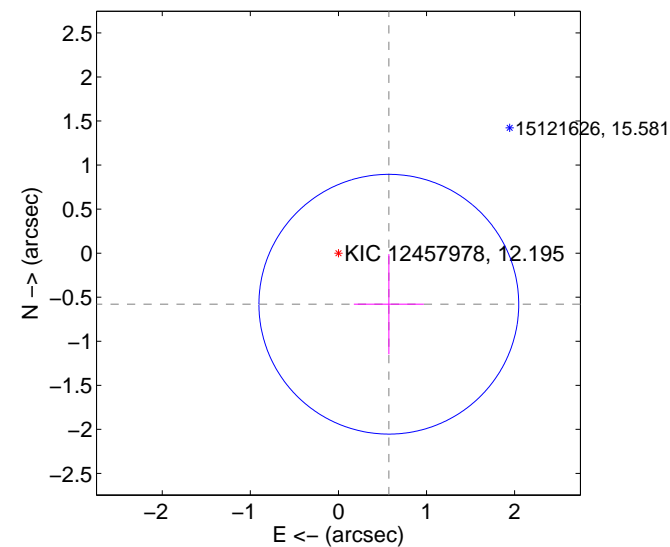
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

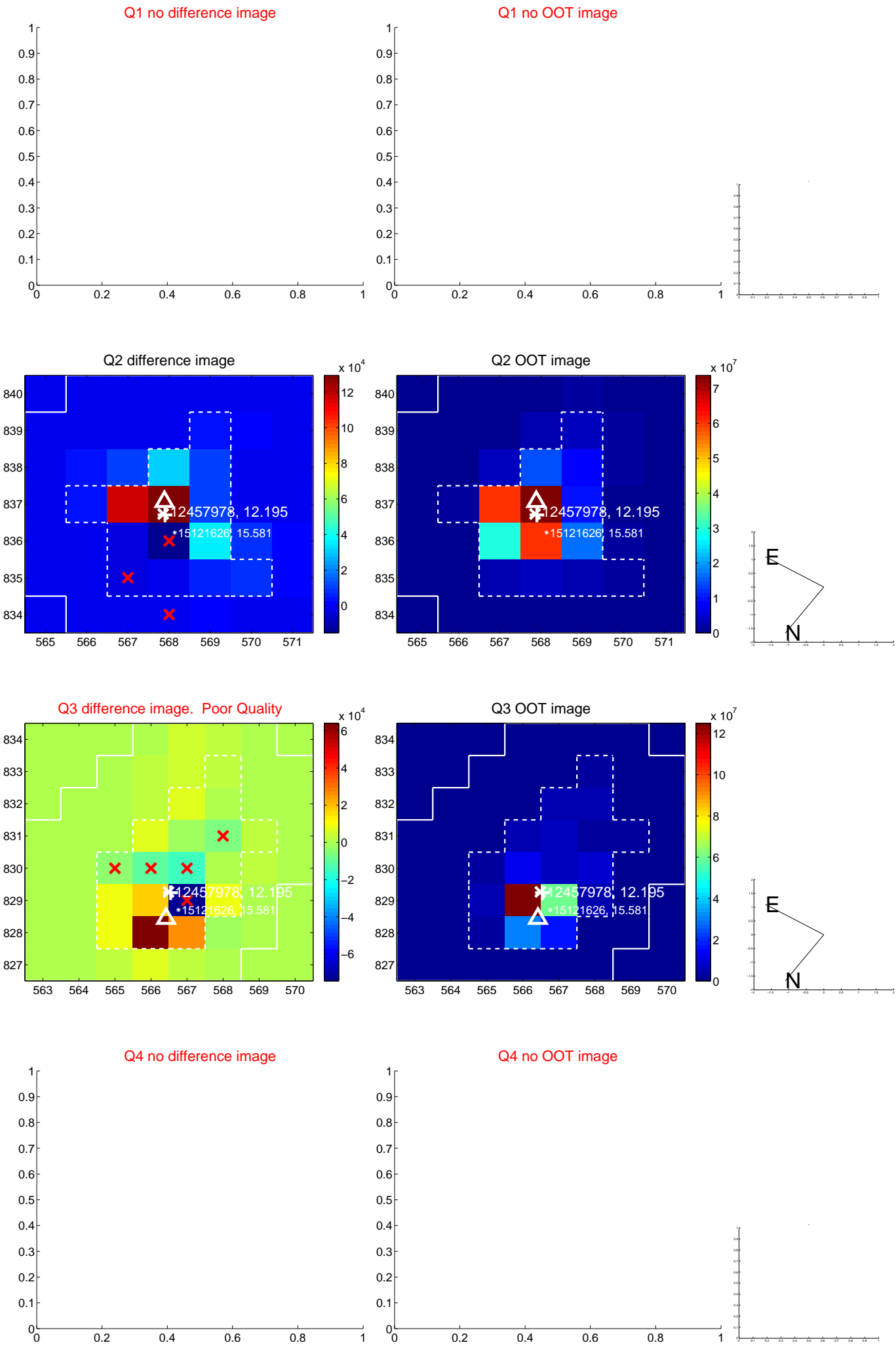


offset from photometric centroids

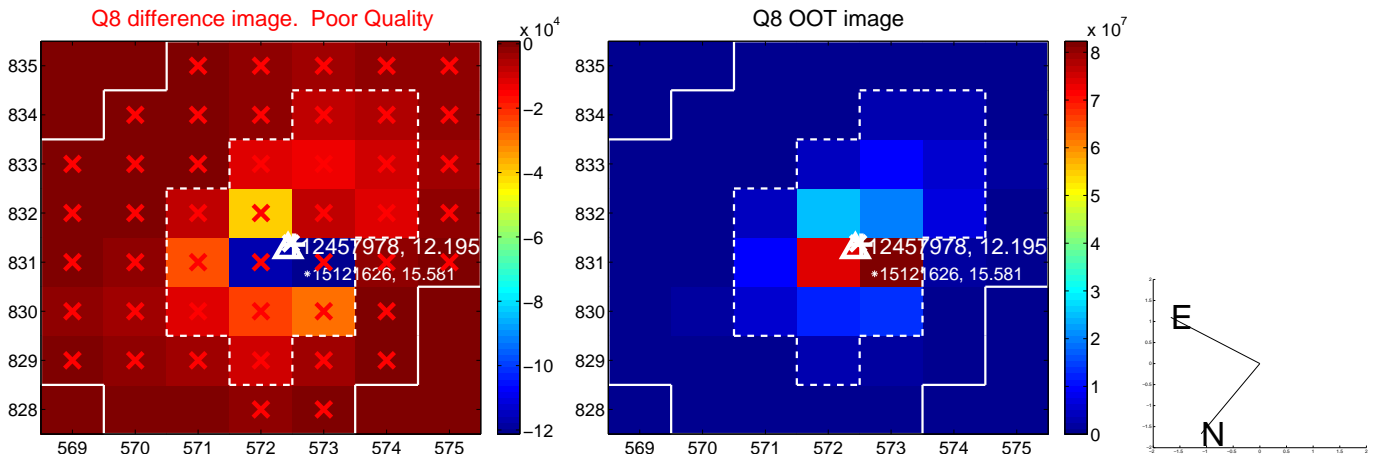
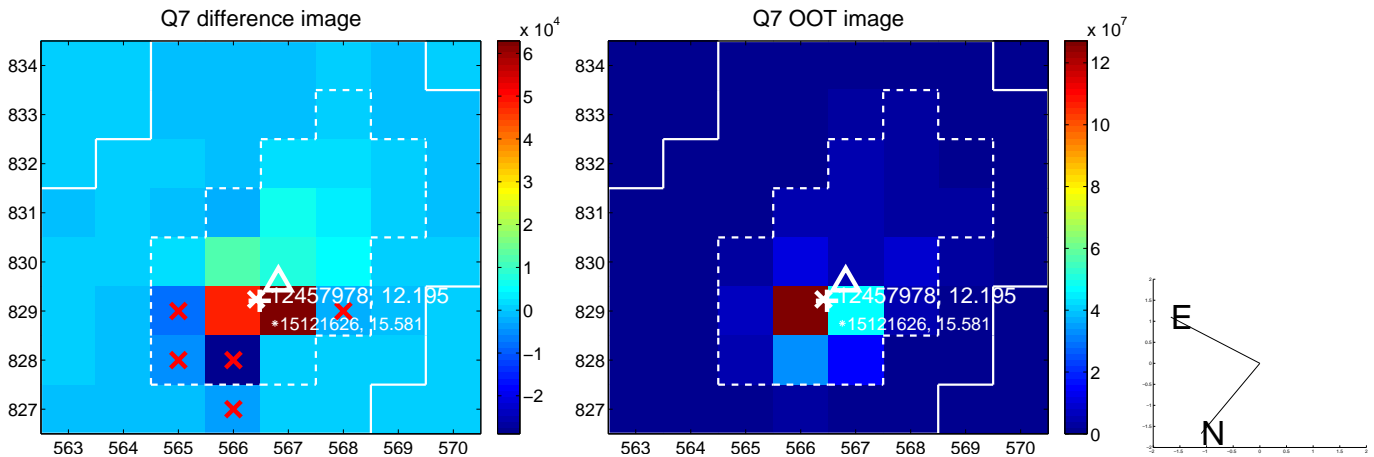
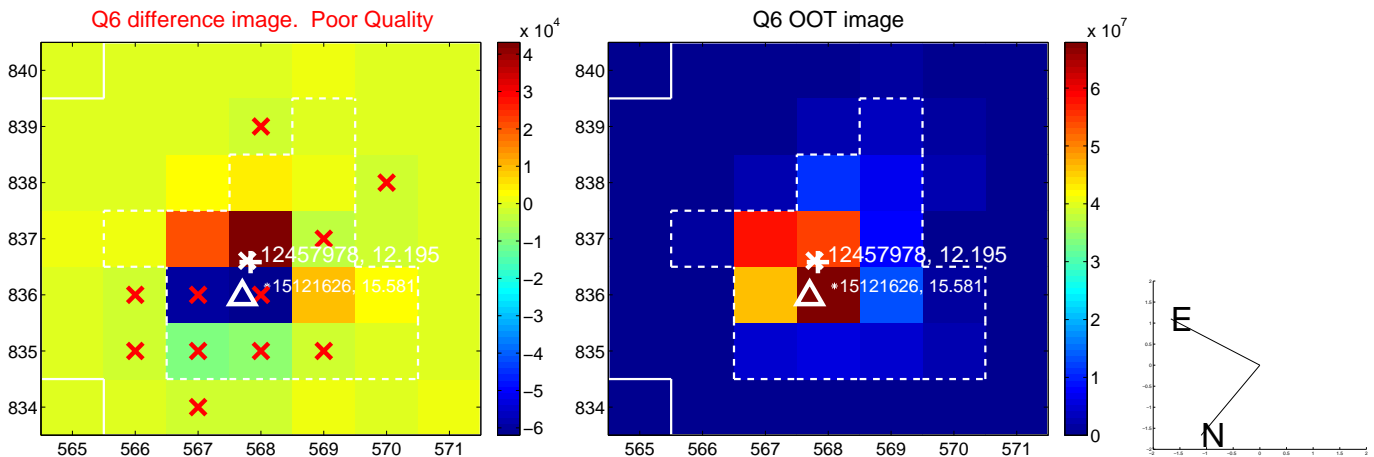
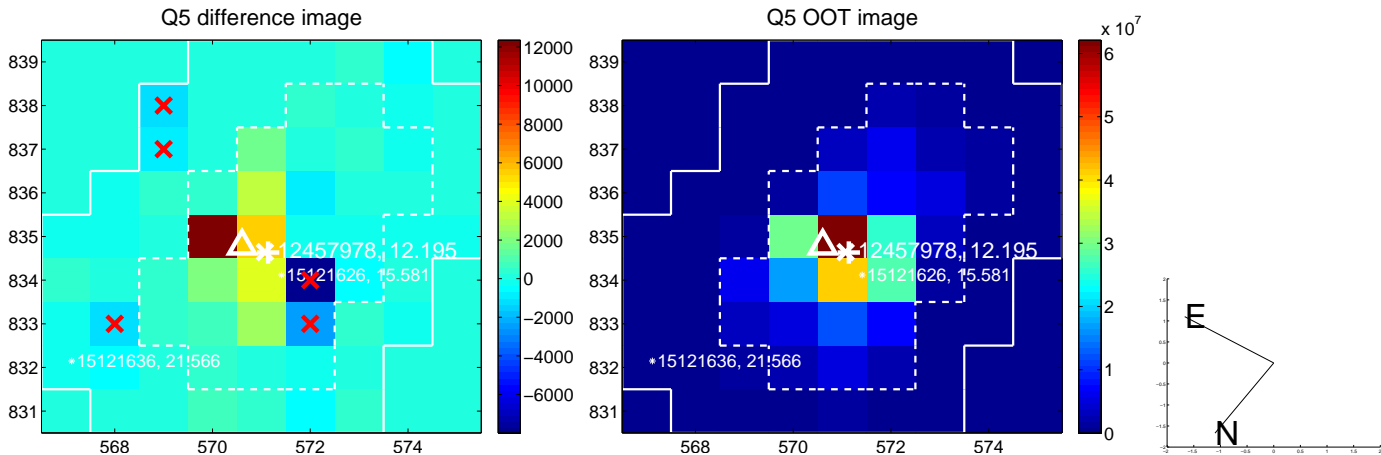


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

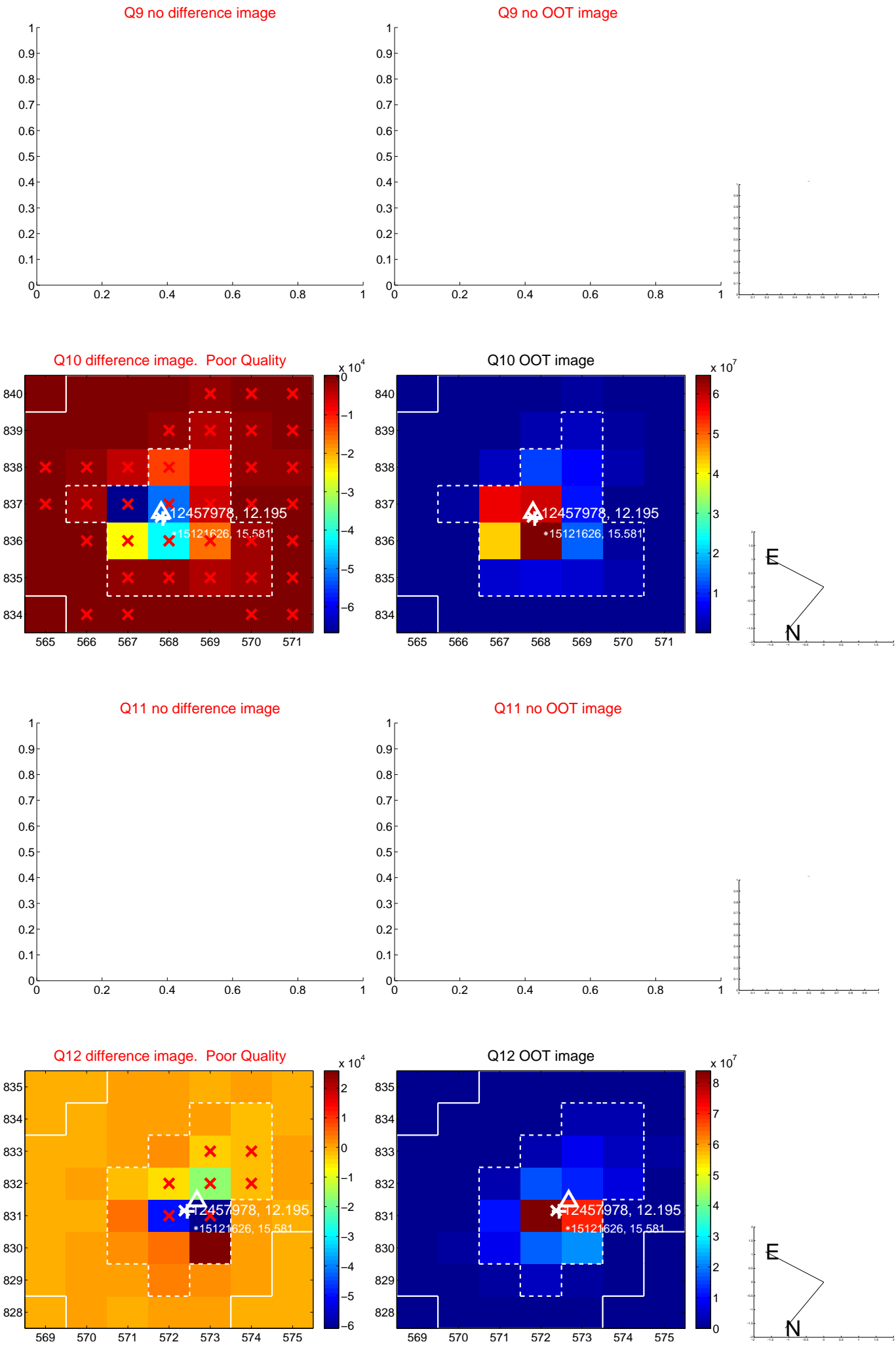
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



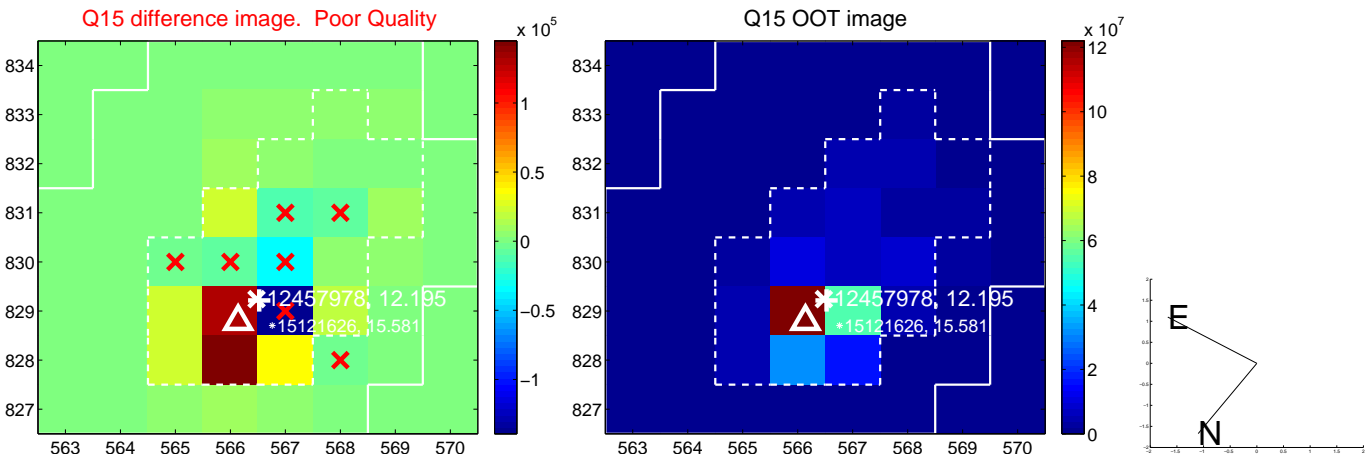
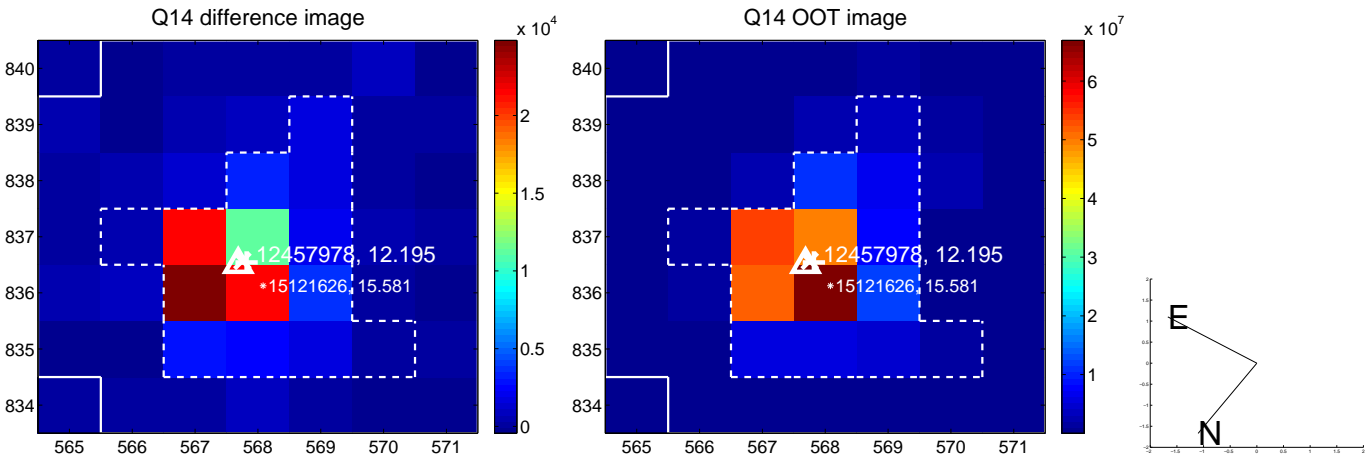
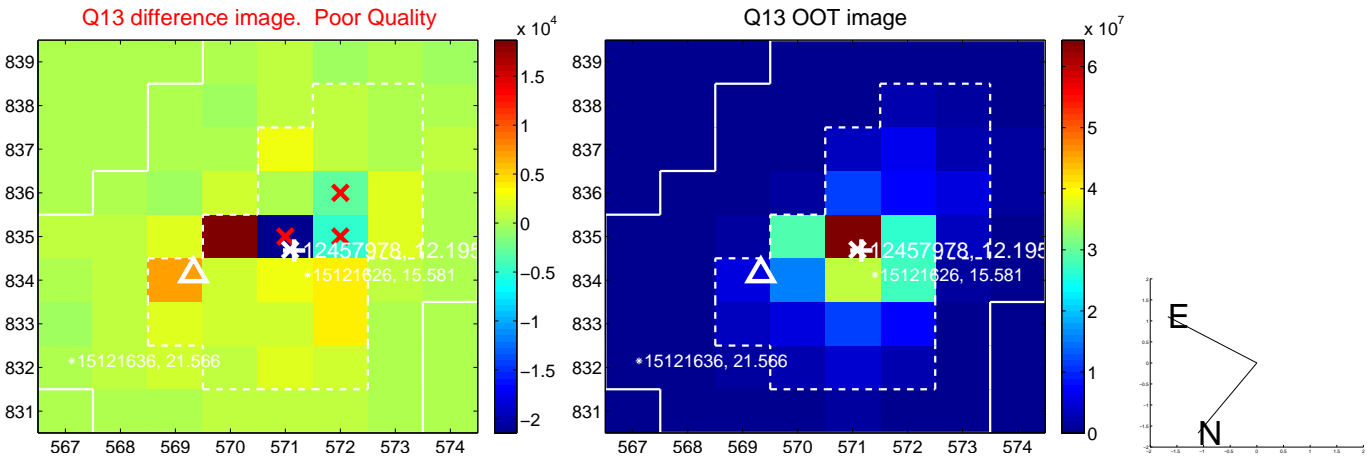
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



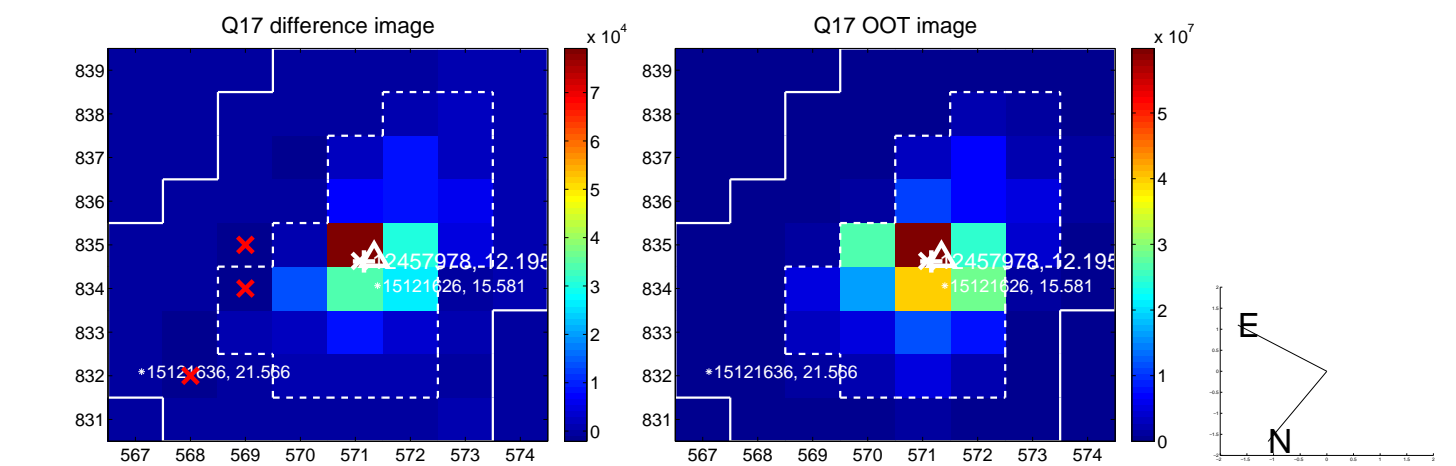
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



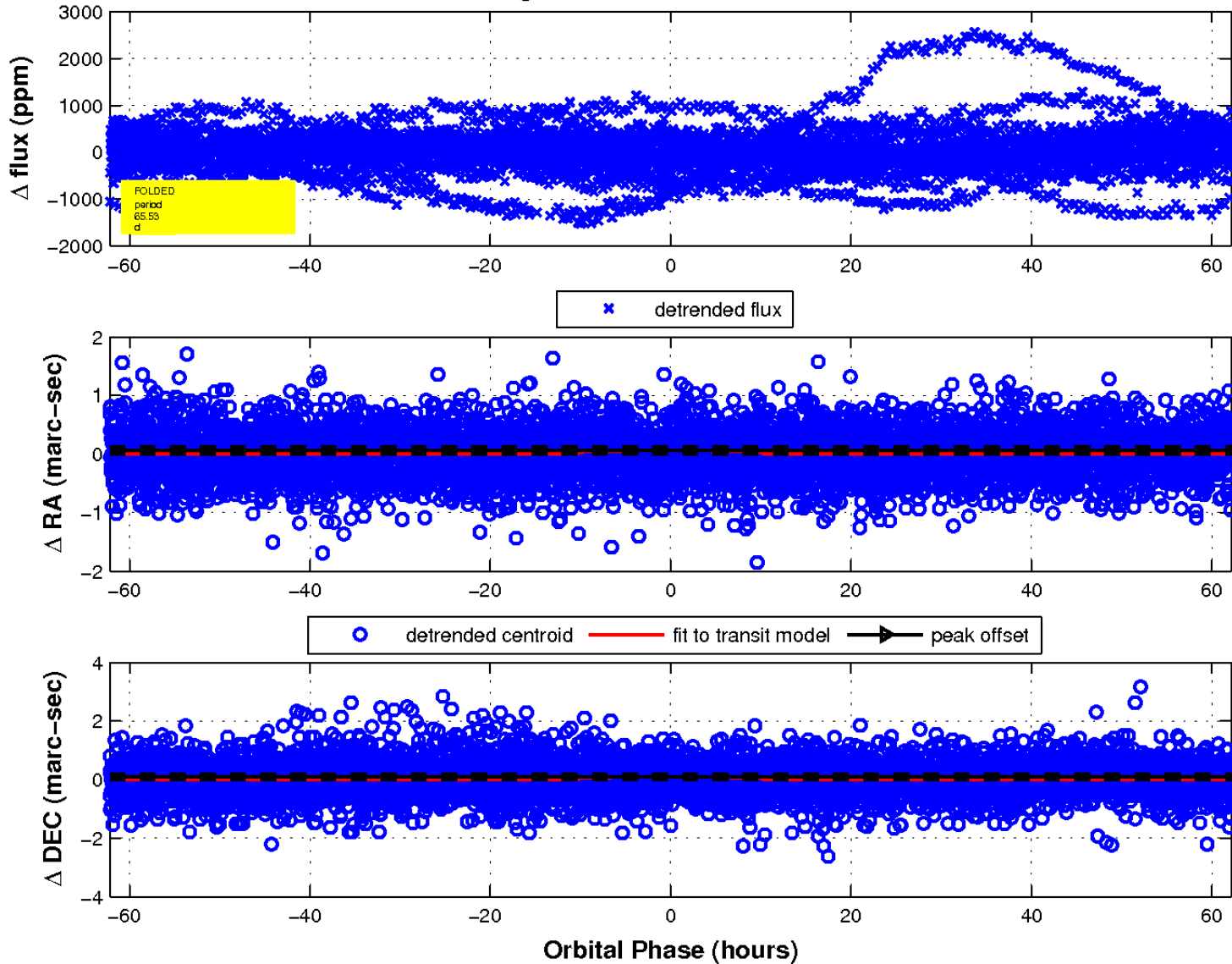
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

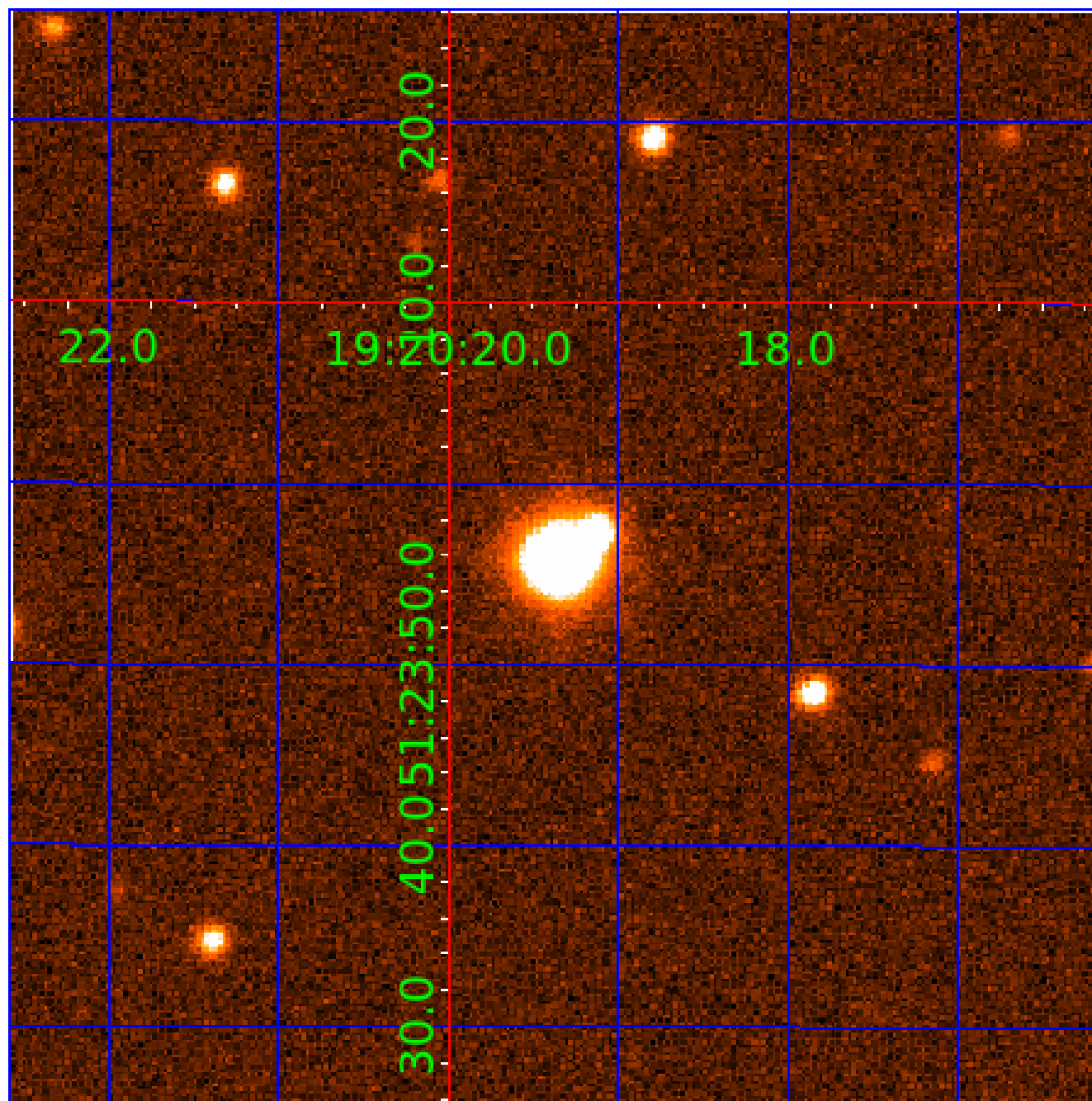


fluxWeightedCentroids, Planet 3 of 9



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

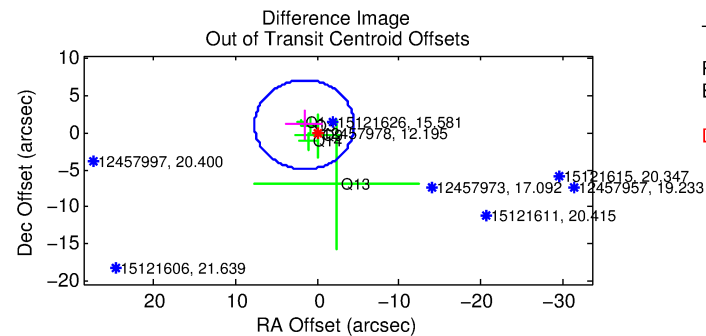
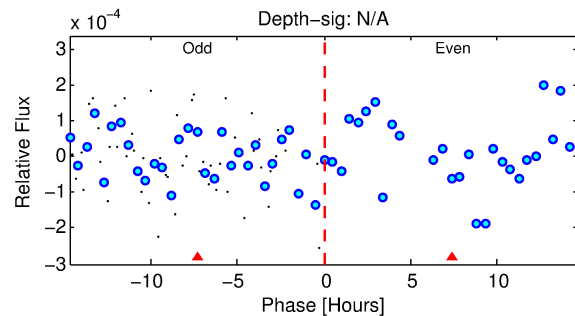
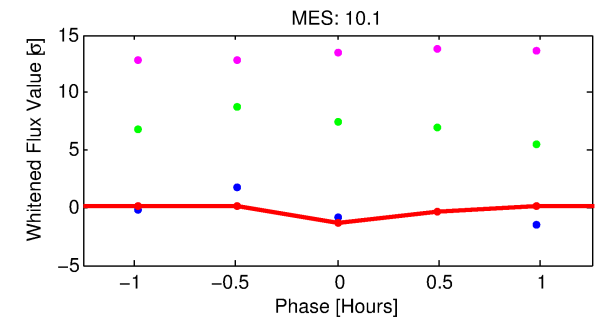
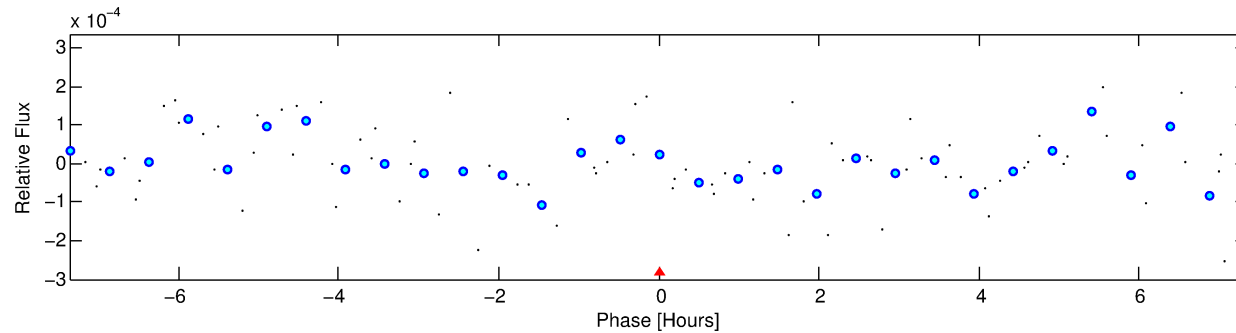
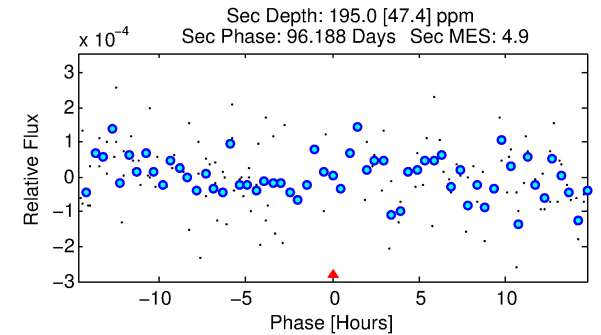
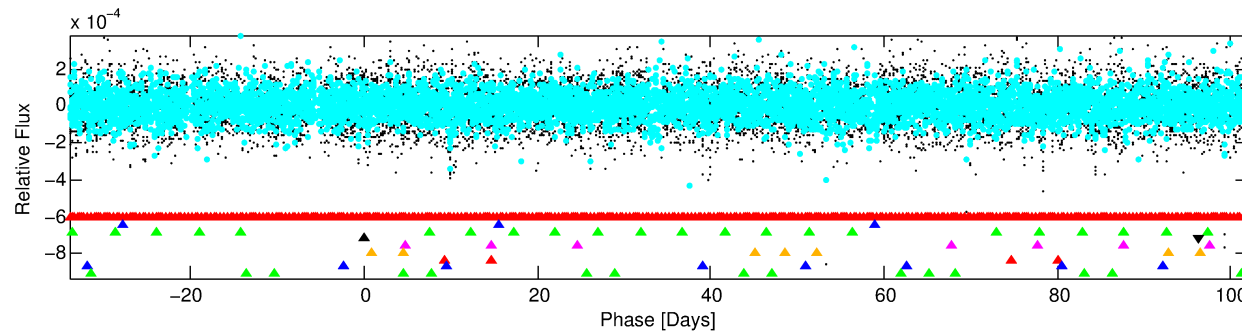
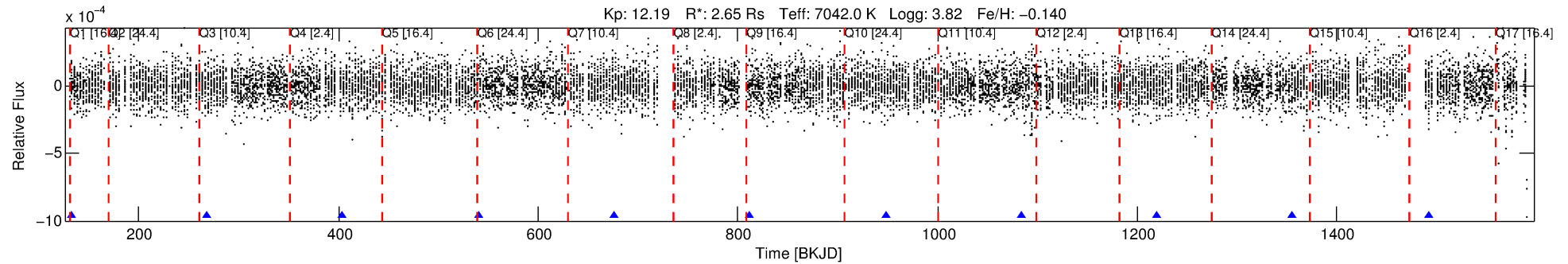
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-04

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 4 of 9 Period: 135.938 d



TPS TCE Results:

Period = 135.93766 d
Epoch = 132.8596 BKJD

DV fit results are unavailable

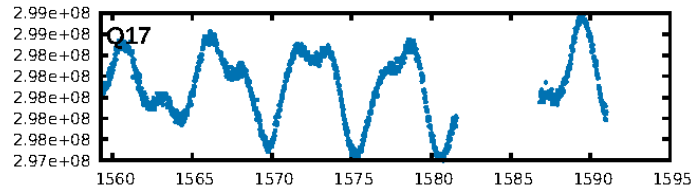
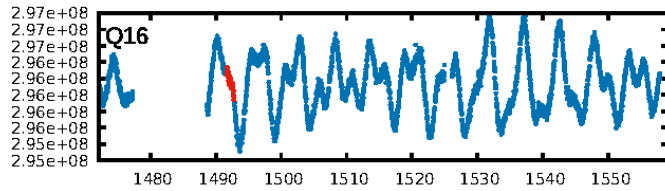
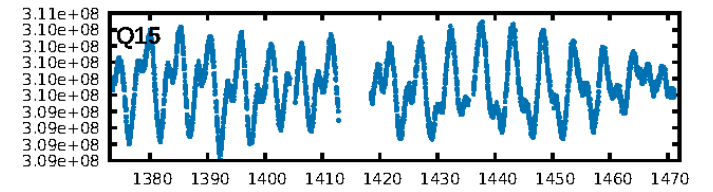
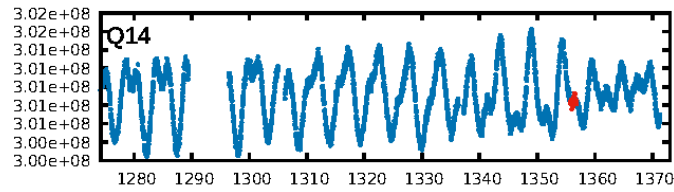
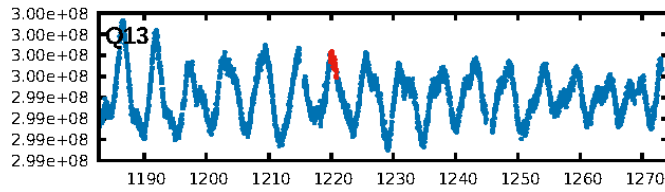
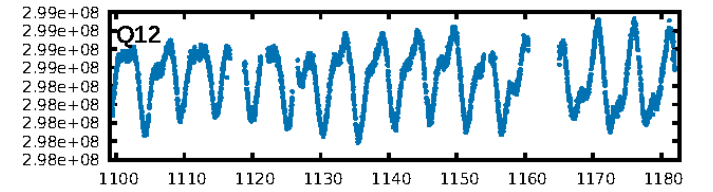
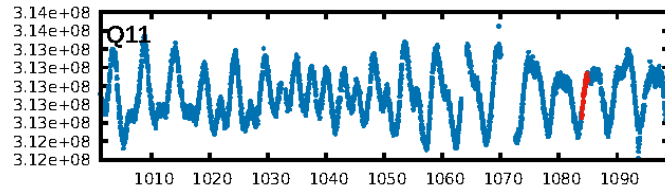
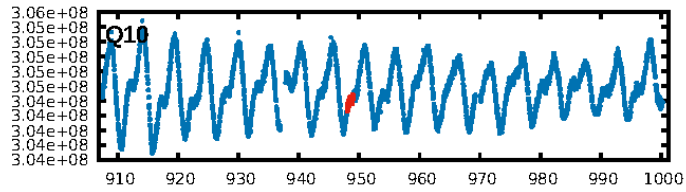
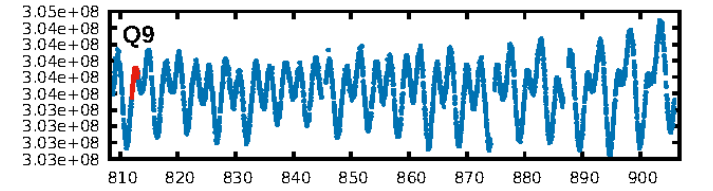
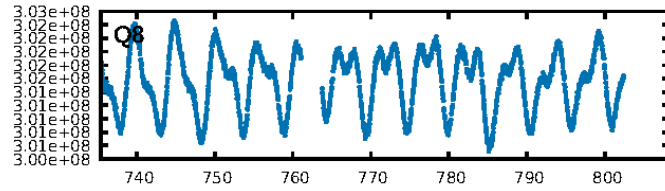
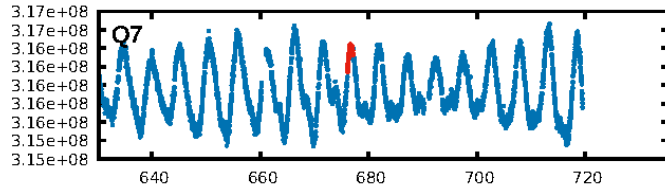
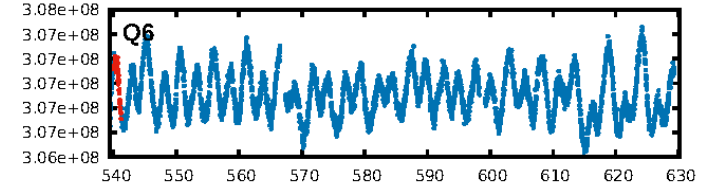
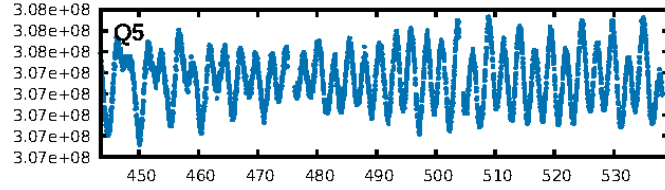
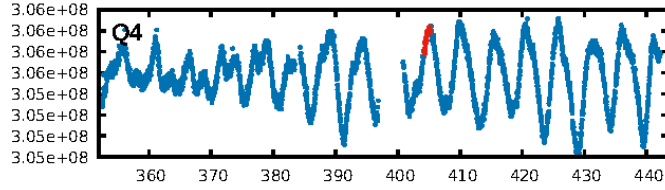
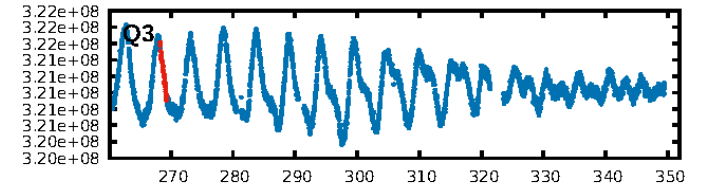
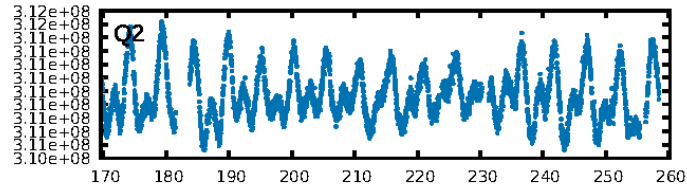
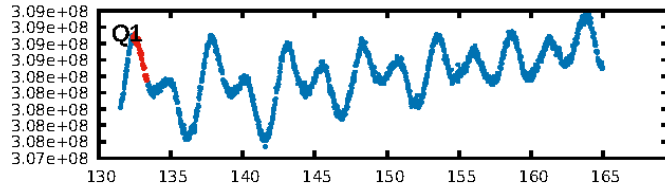
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [65.91σ]
LongPeriod-sig: 100.0% [77.57σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.62e-09
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.2429
Centroid-sig: 12.5%
Centroid-so: 1.169 arcsec [1.21σ]
OotOffset-rm: 1.932 arcsec [0.96σ]
KicOffset-rm: 1.704 arcsec [0.85σ]
OotOffset-st: 1/1/0/3 [5]
KicOffset-st: 1/1/0/3 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 0.60 [6/10]

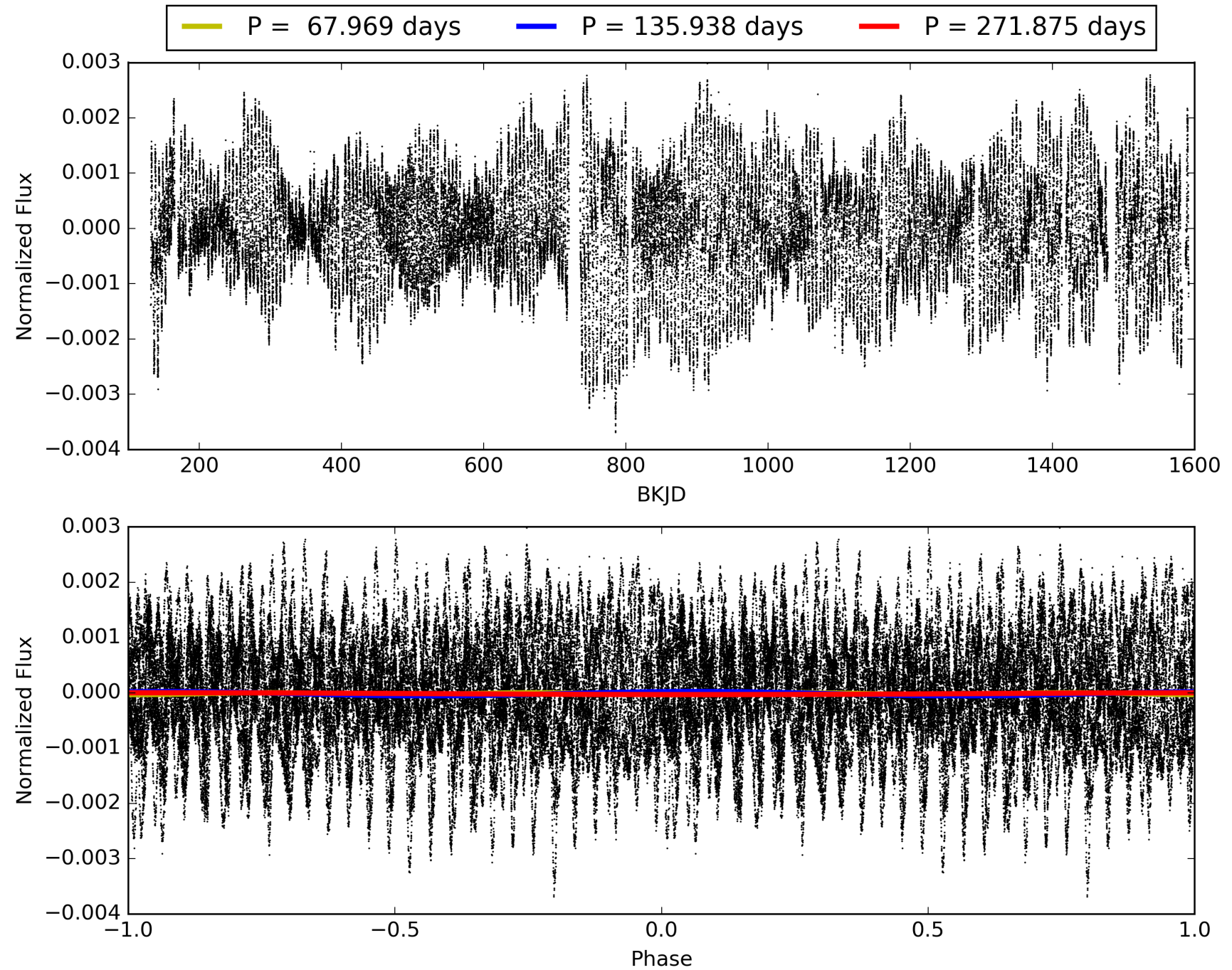
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:21:56 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-04, PDC Light Curves

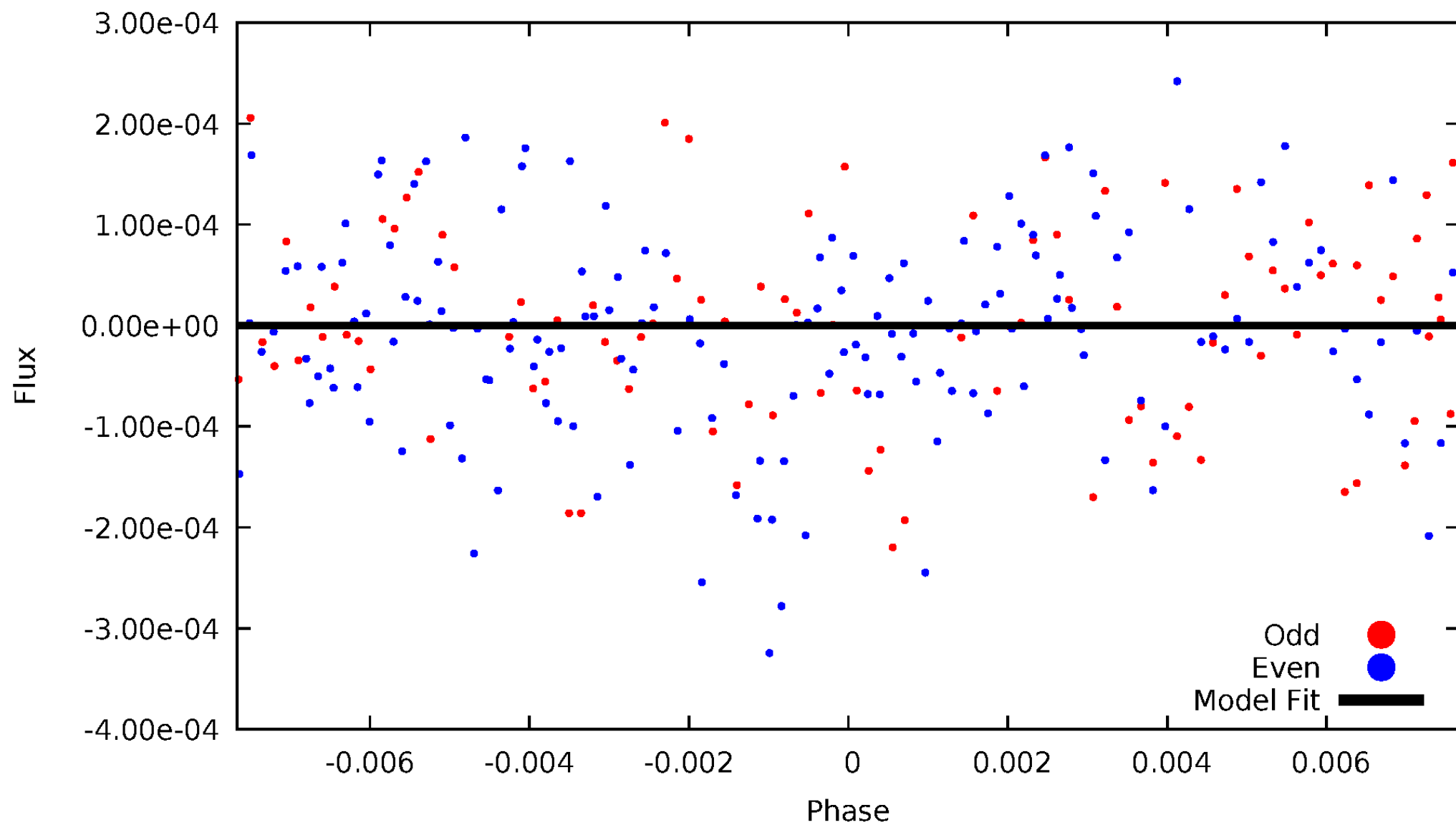


TCE 012457978-04



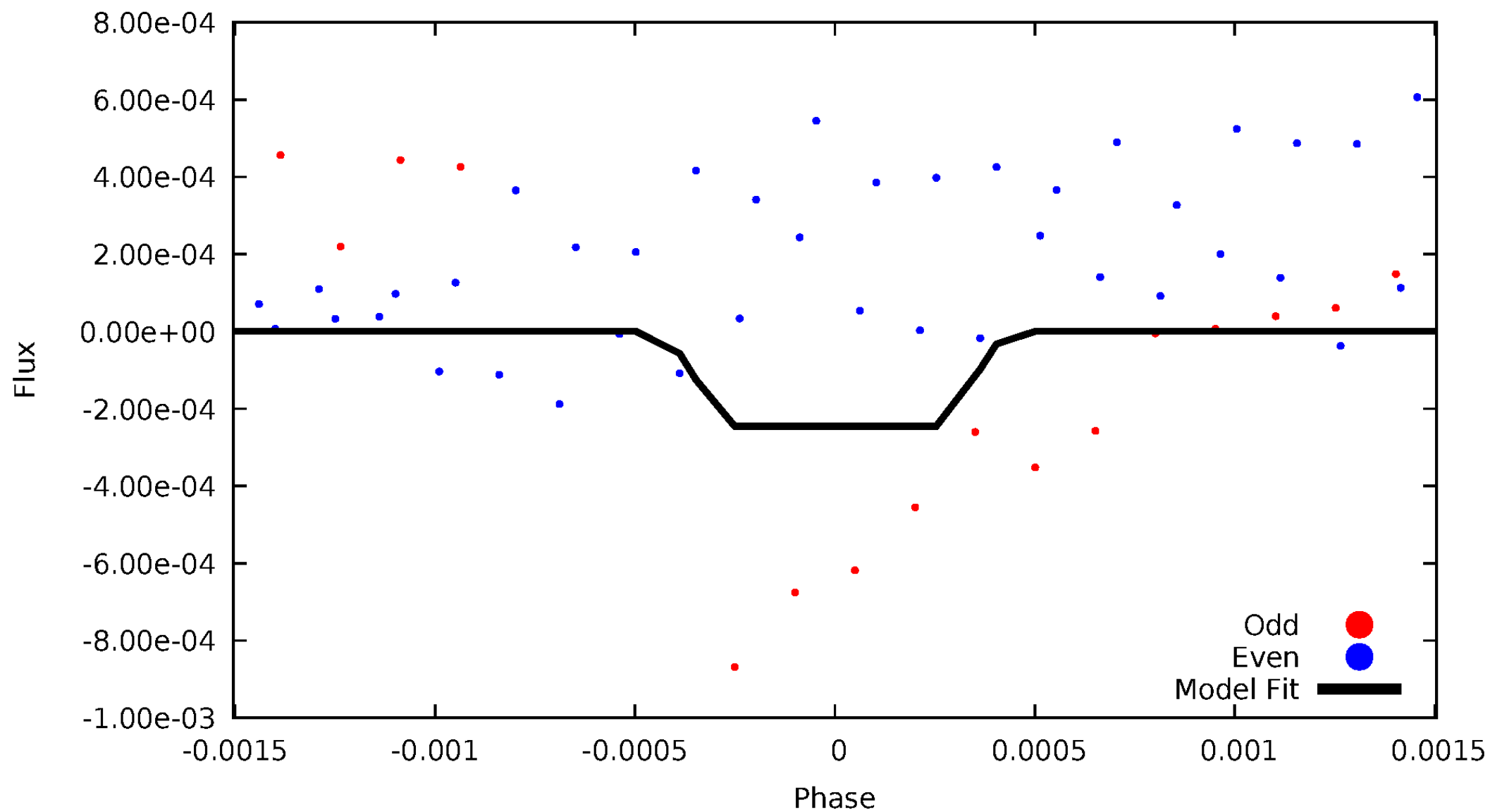
DV Odd/Even

TCE 012457978-04



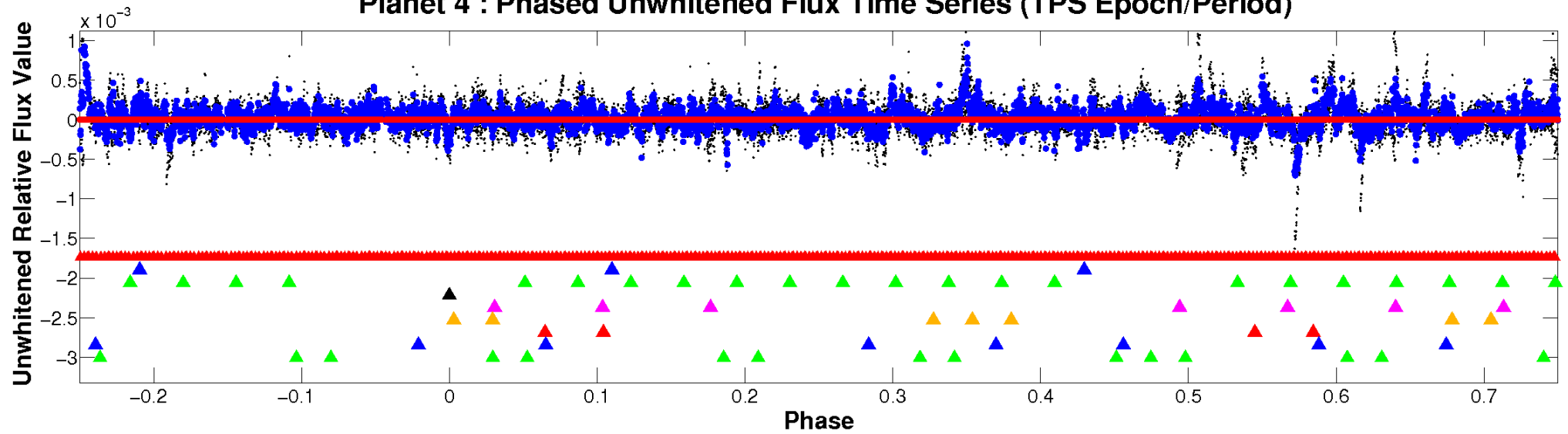
ALT Odd/Even

TCE 012457978-04

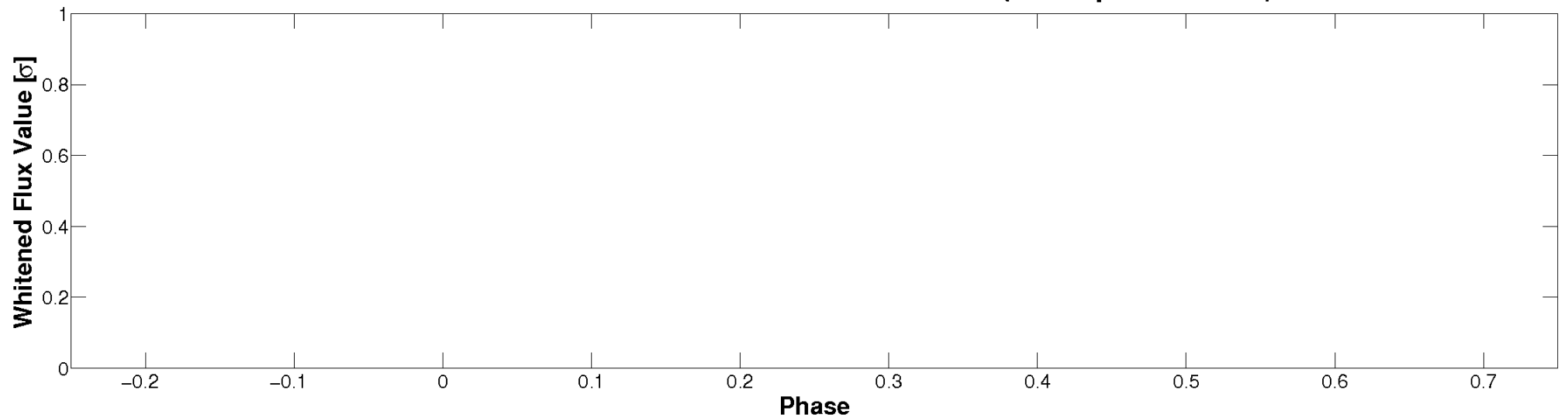


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

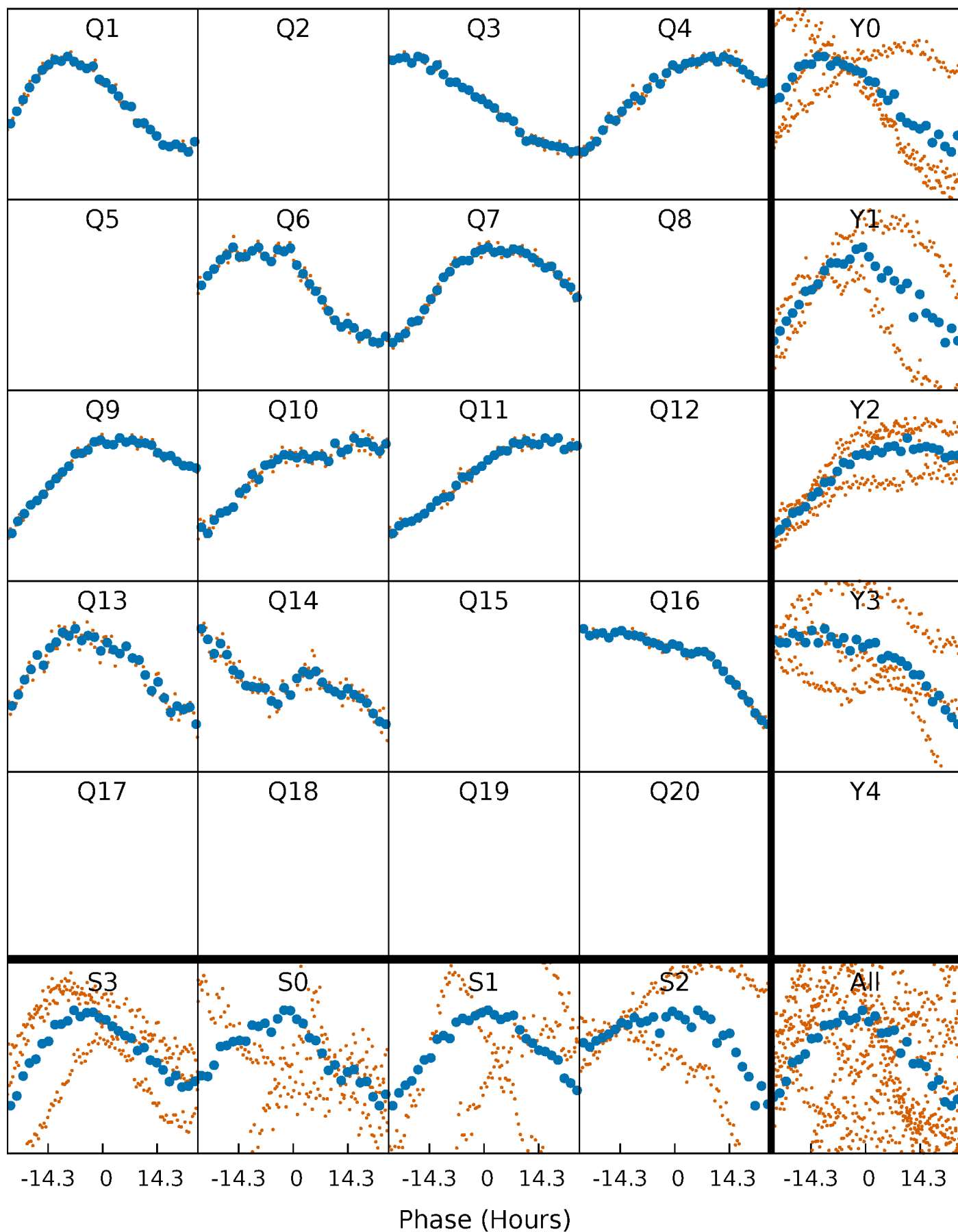


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



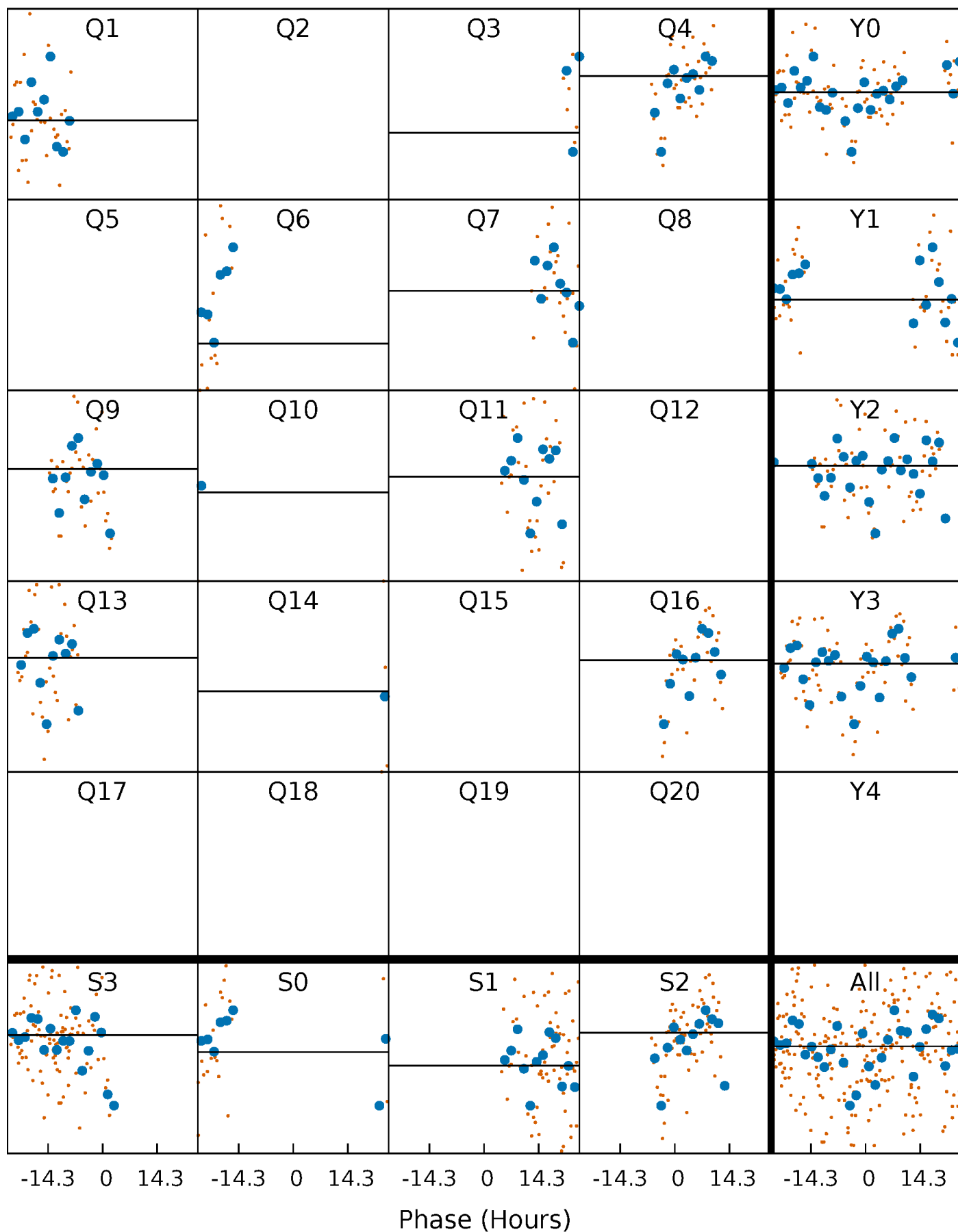
PDC Quarter-Phased Transit Curves

TCE 012457978-04 P=135.937664 Days $T_0=132.859609$ (BKJD)



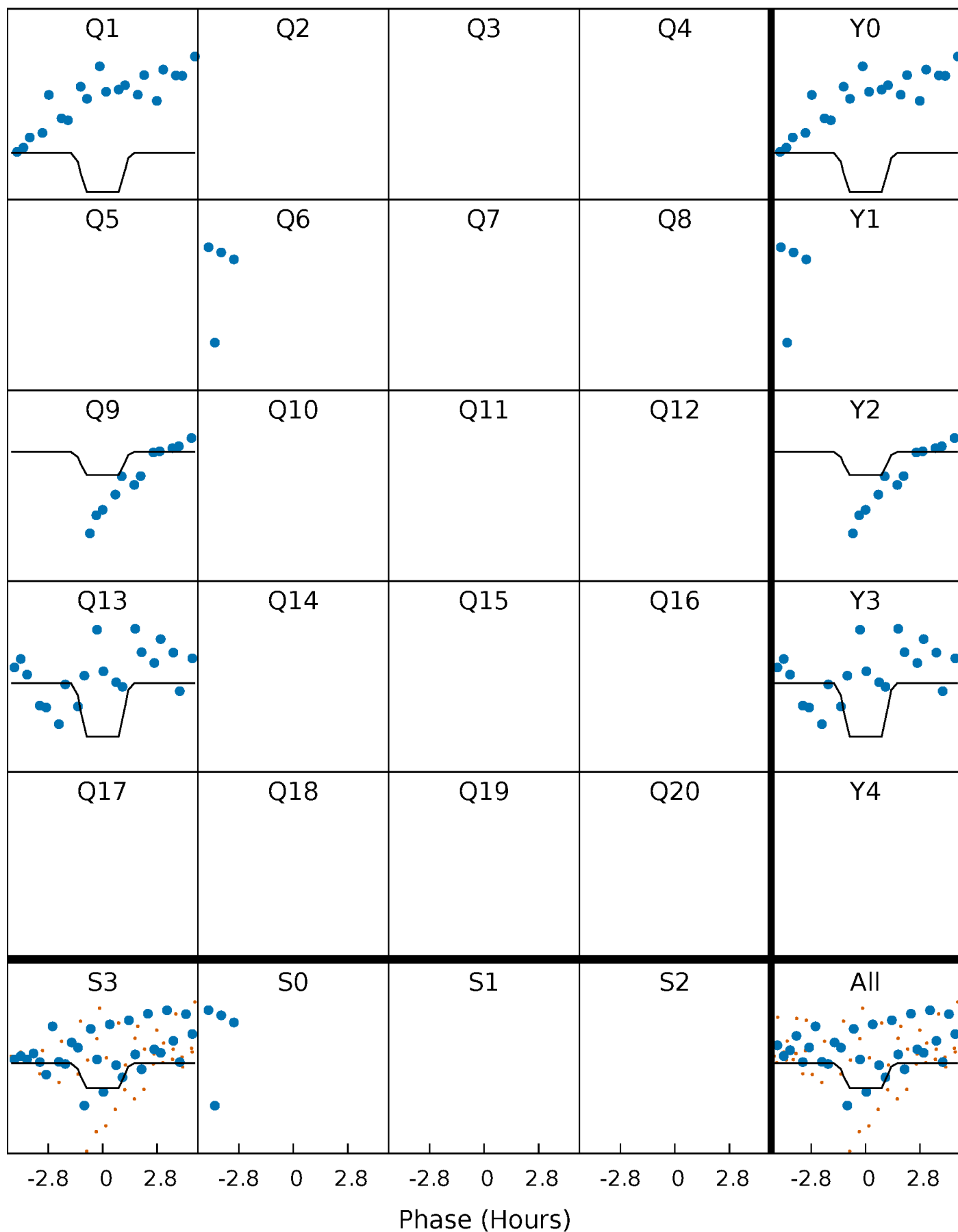
DV Quarter-Phased Transit Curves

TCE 012457978-04 P=135.937664 Days $T_0=132.859609$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

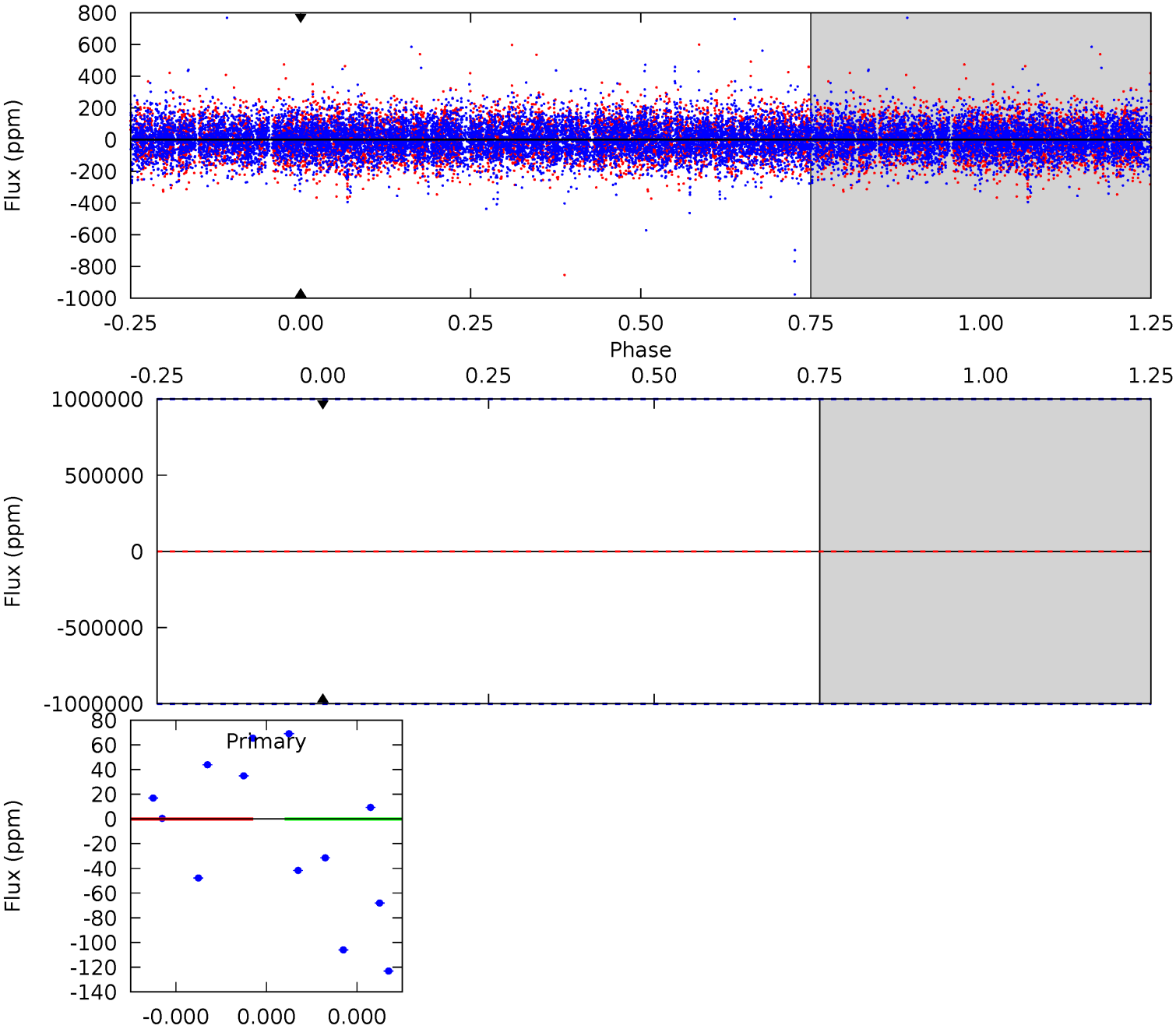
TCE 012457978-04 P=135.937664 Days $T_0=132.315310$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-04, P = 135.937664 Days, E = 132.859609 Days

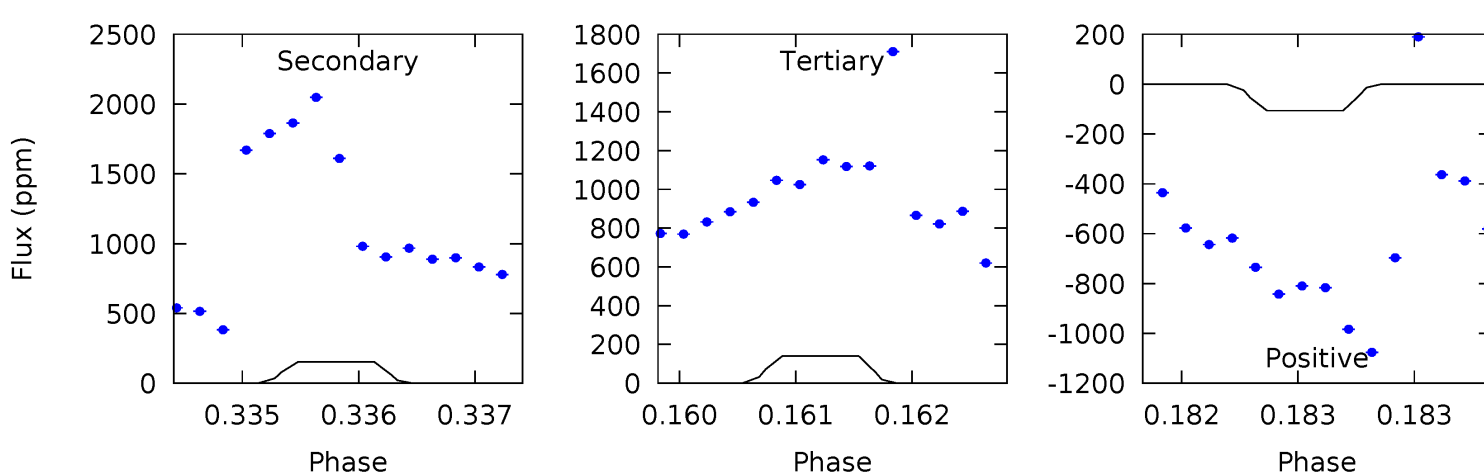
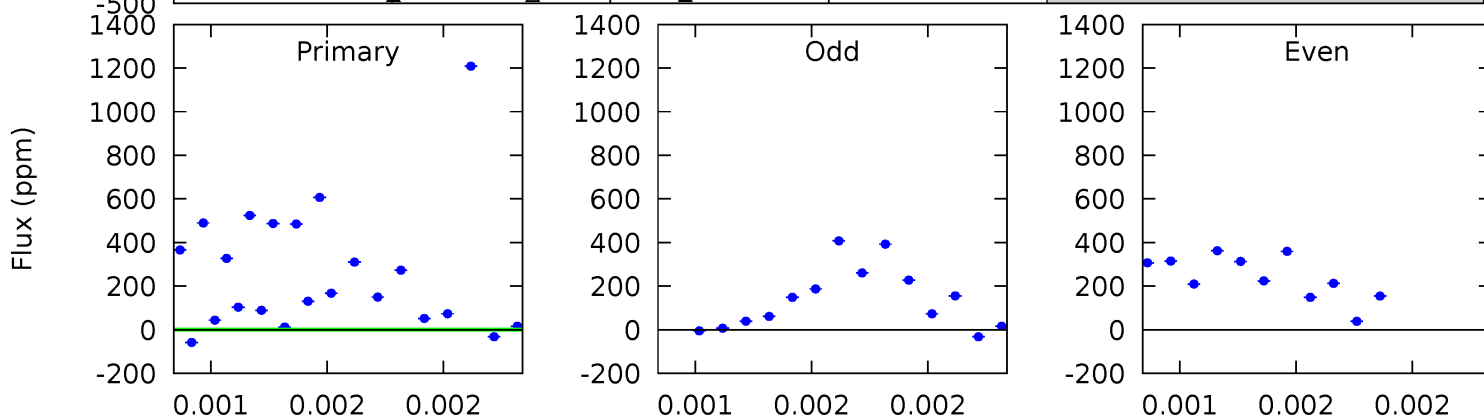
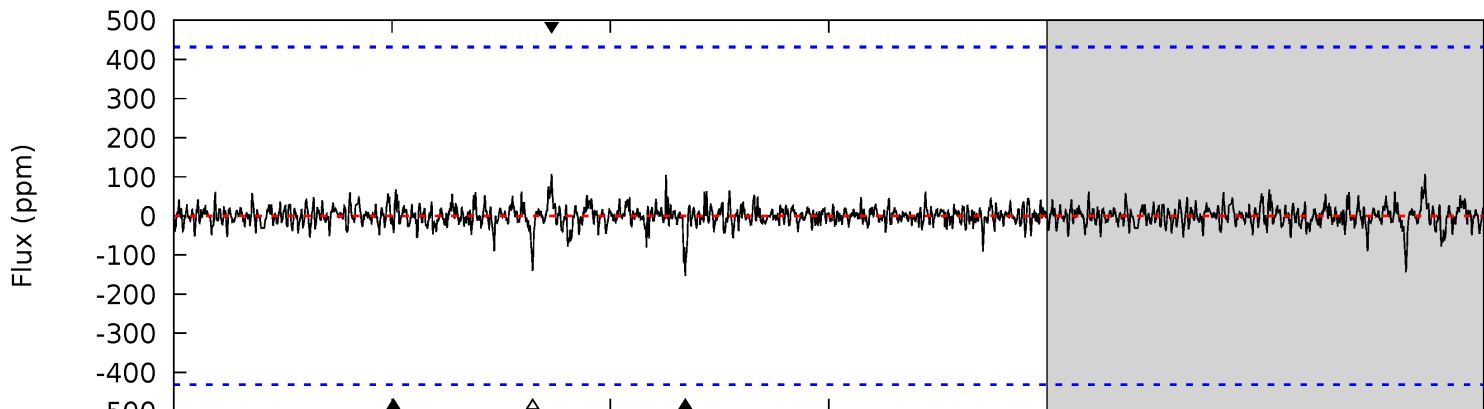
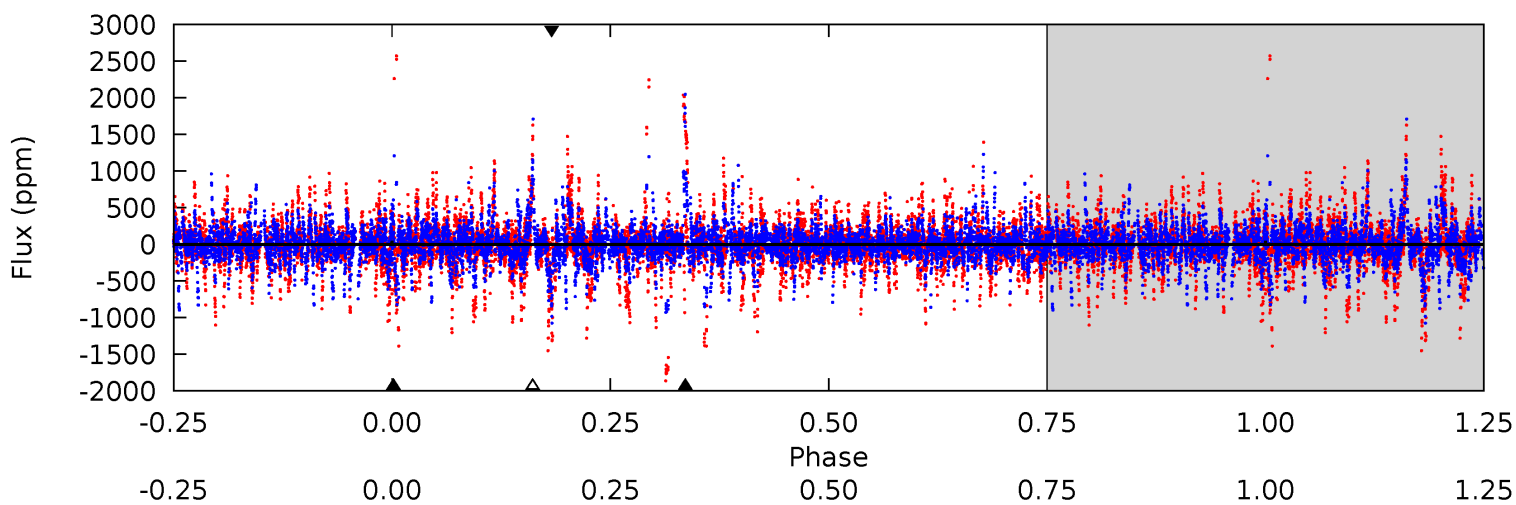
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

012457978-04, P = 135.937664 Days, E = 132.315310 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.40	1.95	1.80	1.36	5.50	3.37	0.27	-1.39	-0.96	0.15	0.59	2.23	-0.58	0.41	1.61



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$20.44^{+21.37}_{-13.76}$	886^{+51}_{-79}	7090^{+29782}_{-34961}	$2454^{+100365}_{-77231}$
Alt.	-153 ± 78	$20.03^{+21.73}_{-13.94}$	883^{+51}_{-78}	3342^{+1717}_{-702}	72^{+739}_{-59}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

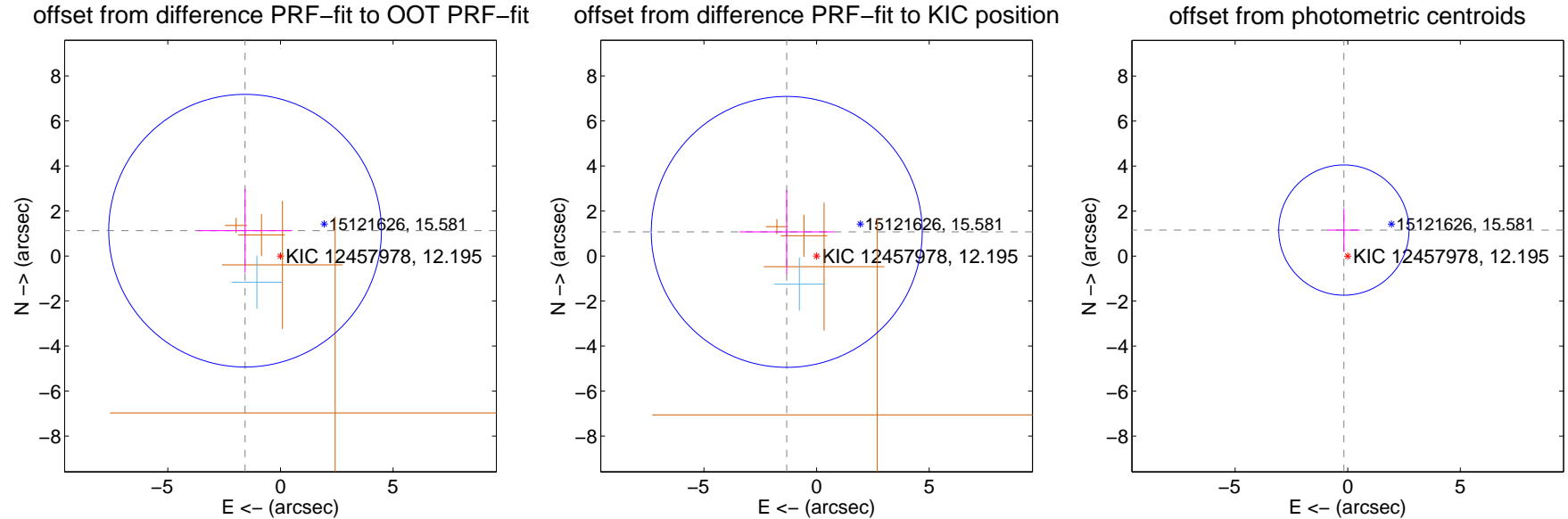
DV Centroid Data

Supplemental centroid analysis for 012457978-04. Kepler magnitude: 12.20. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

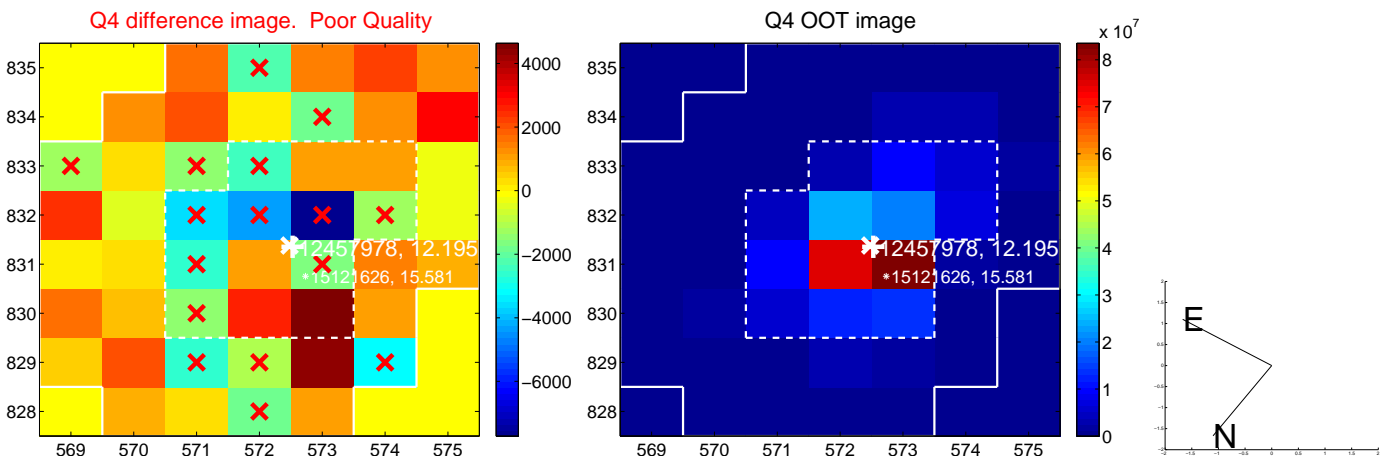
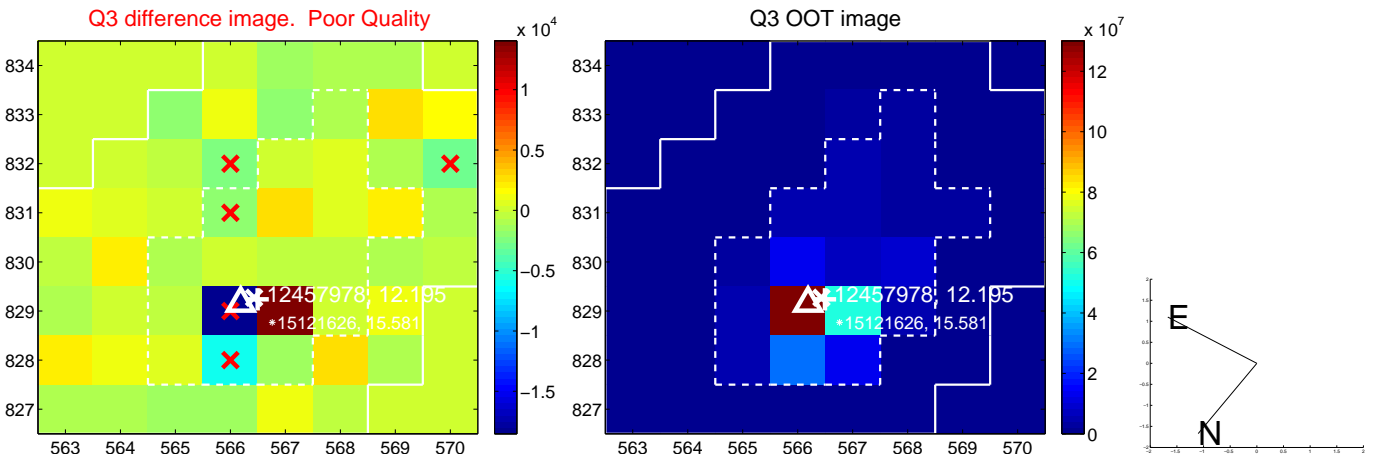
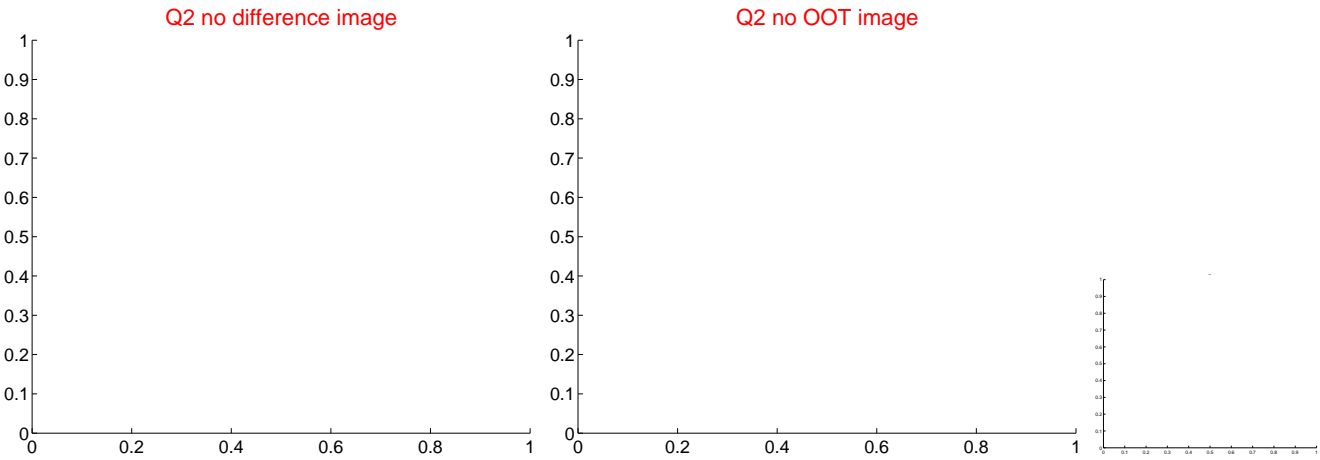
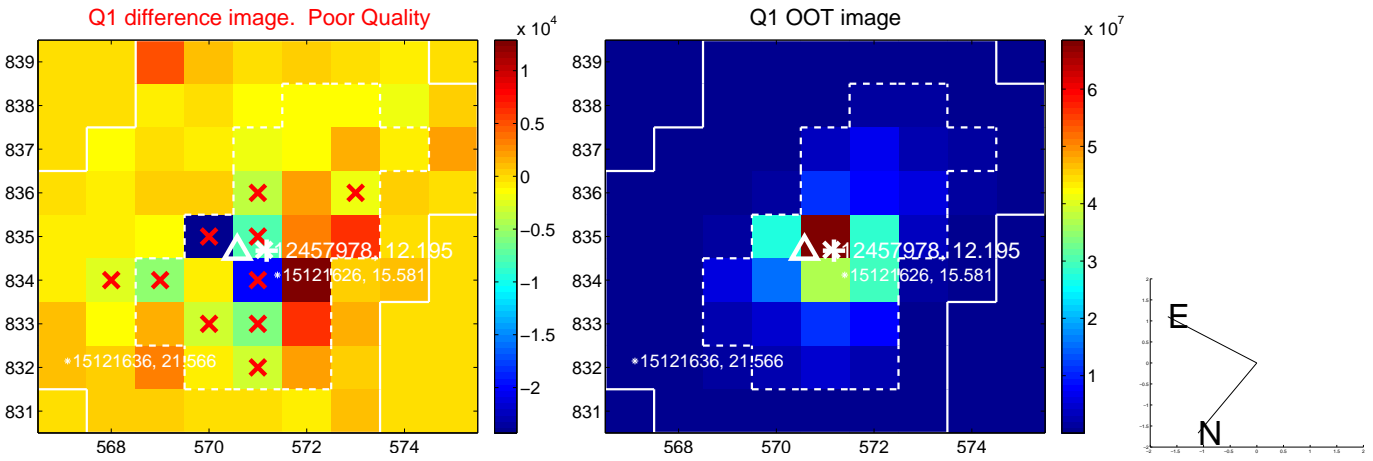
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.932 ± 2.018	0.96	1.571 ± 2.094	1.126 ± 1.860
PRF-fit source offset from KIC position	1.704 ± 2.005	0.85	1.325 ± 2.094	1.072 ± 1.860
photometric centroid source offset	1.17 ± 0.96	1.21	0.17 ± 0.71	1.16 ± 0.97



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

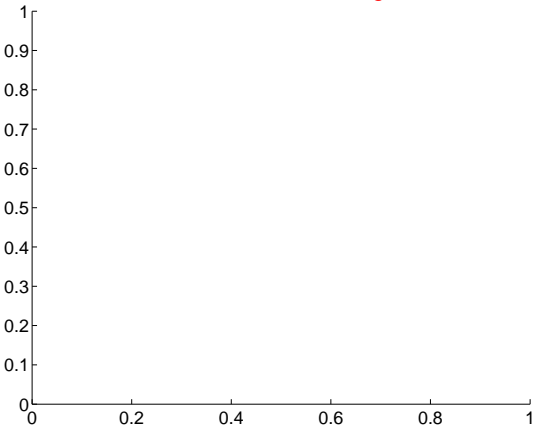
Q5 no difference image



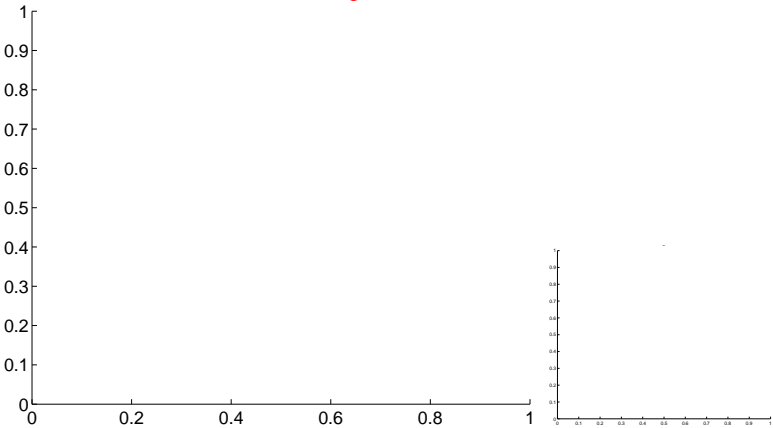
Q5 no OOT image



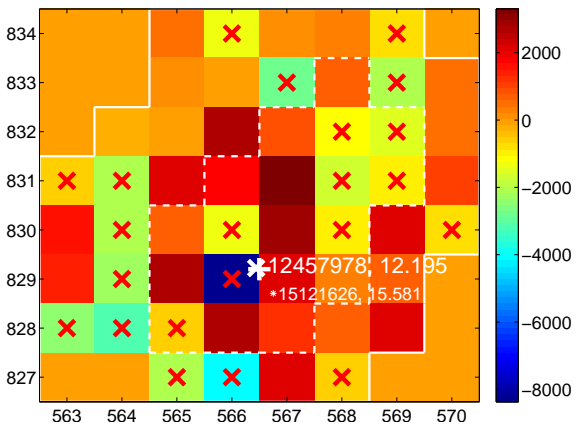
Q6 no difference image



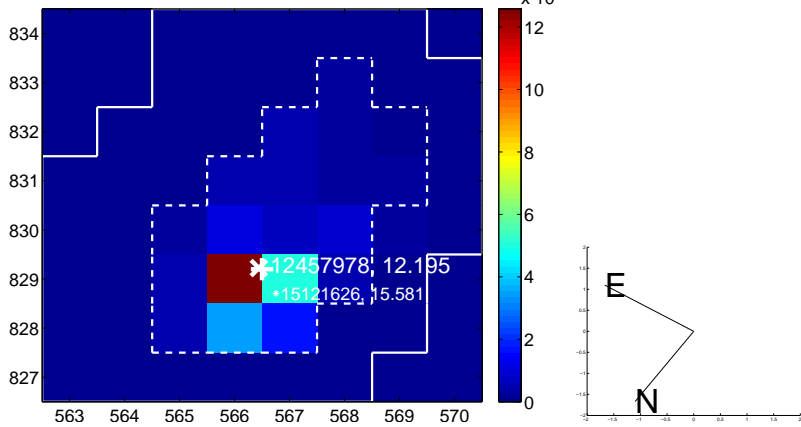
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



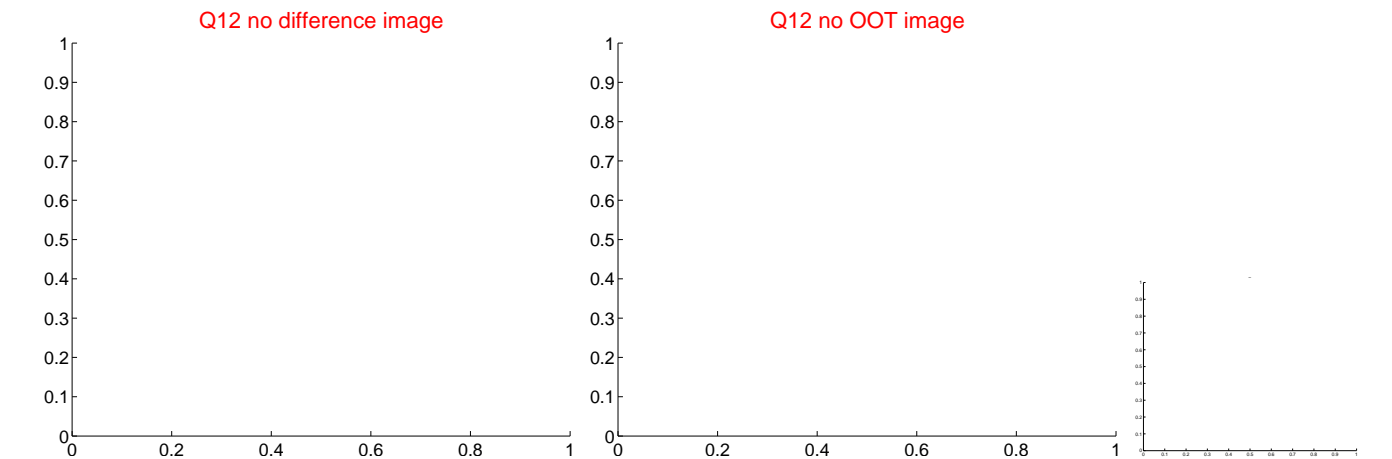
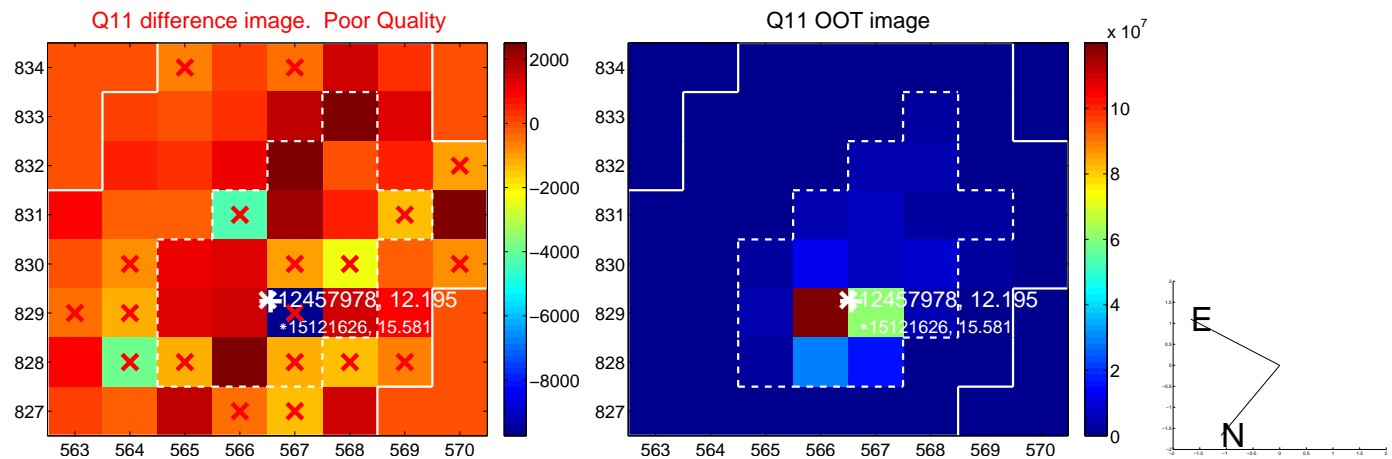
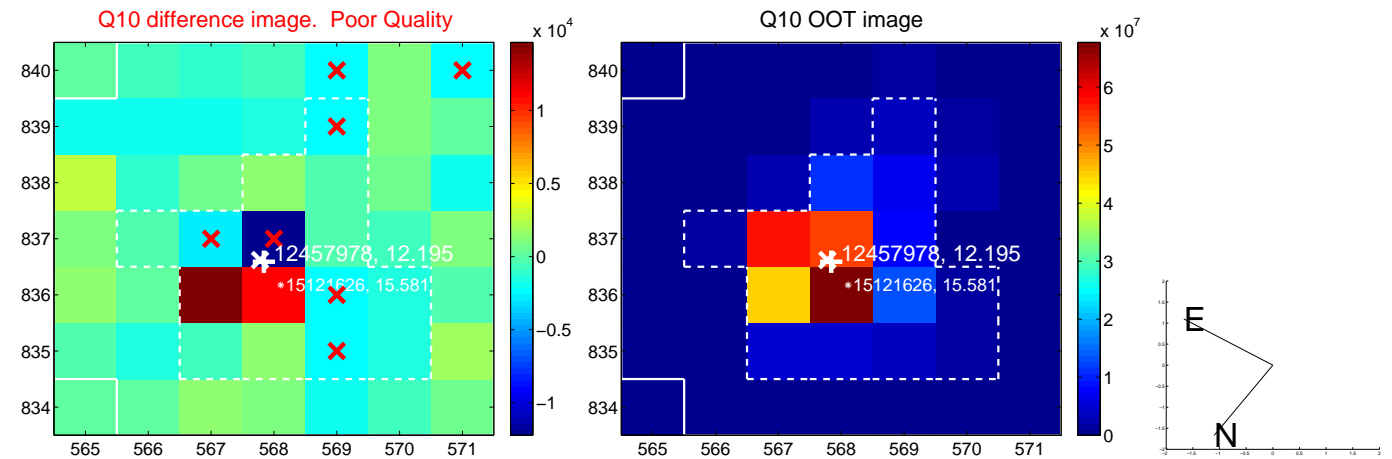
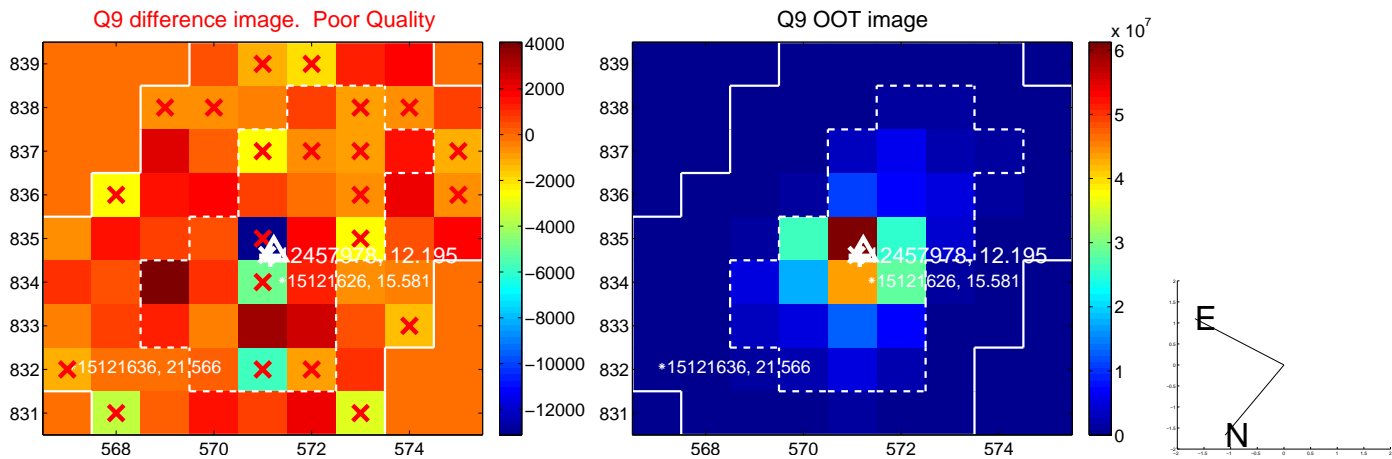
Q8 no difference image



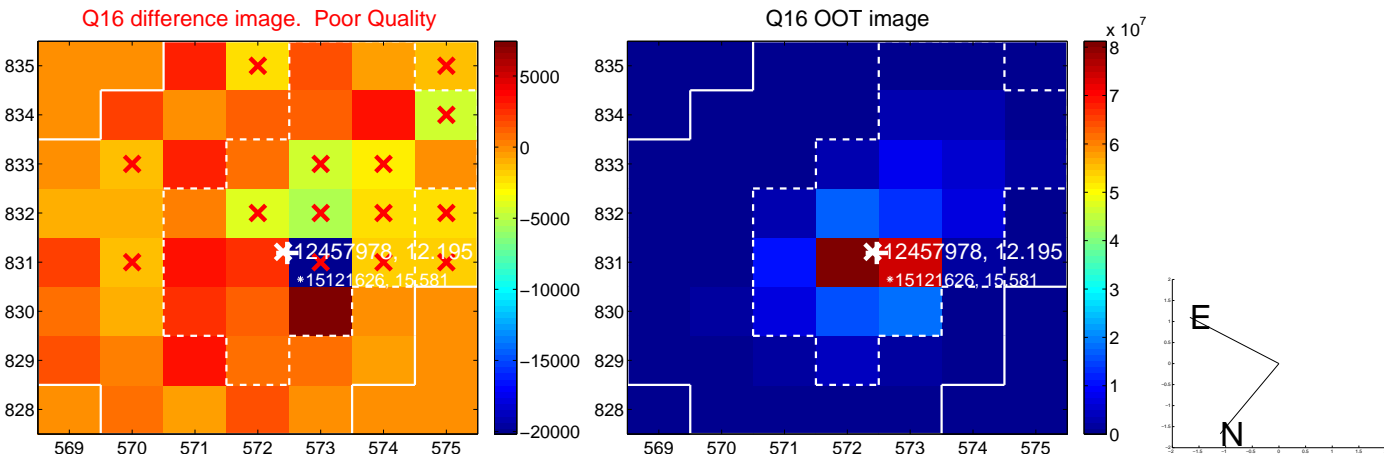
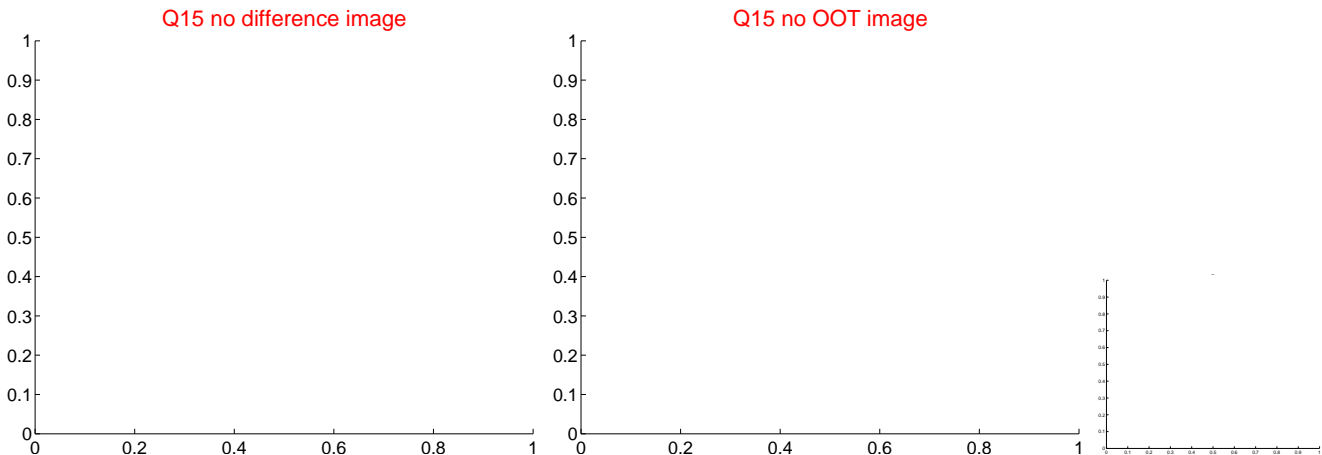
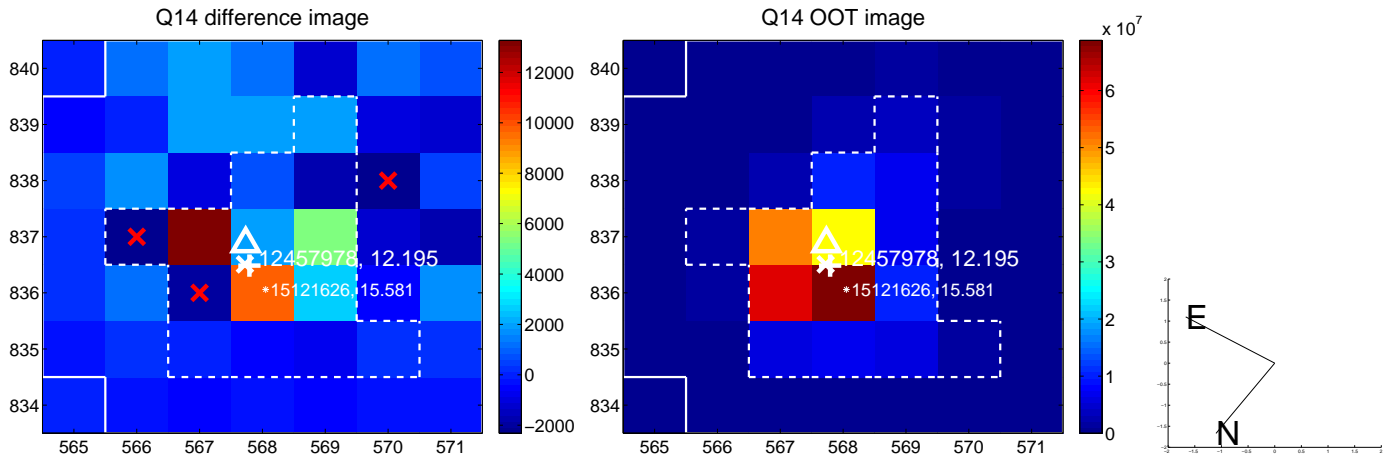
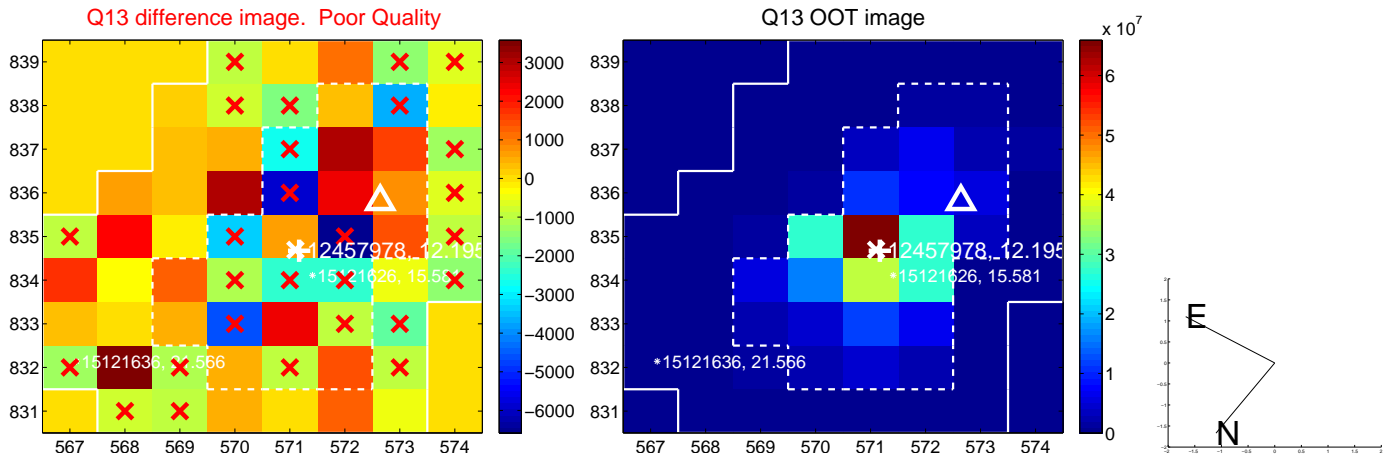
Q8 no OOT image



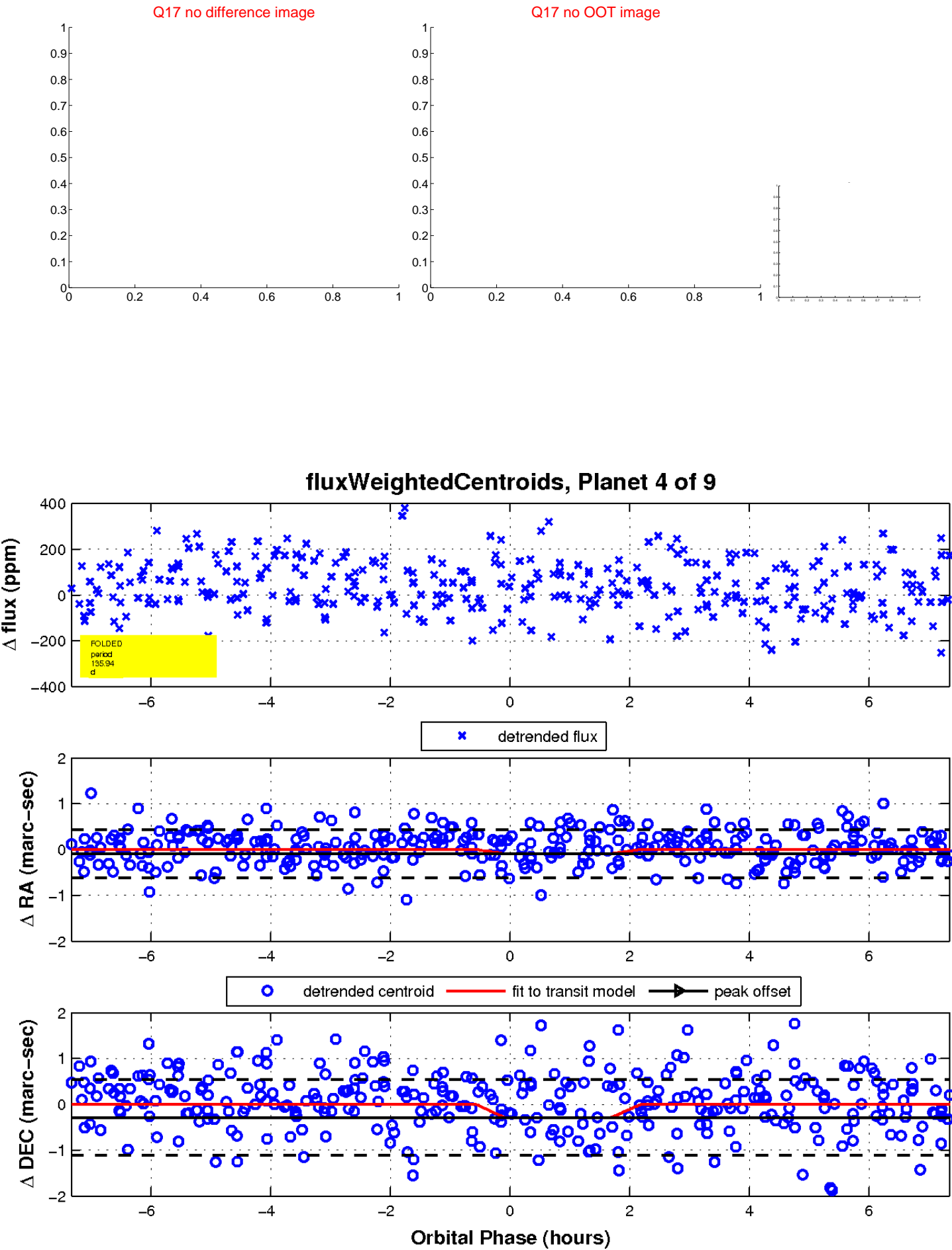
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

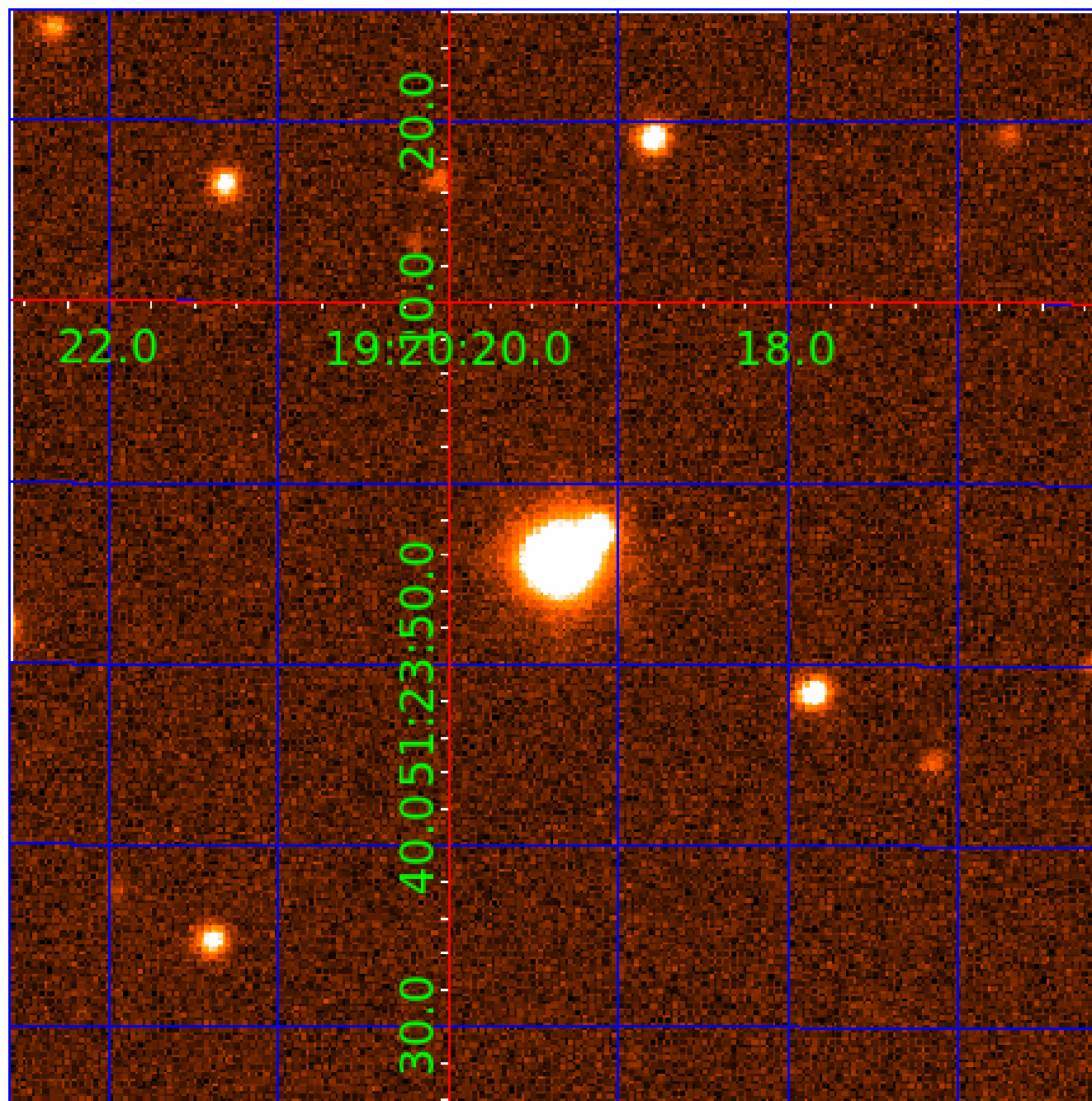


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

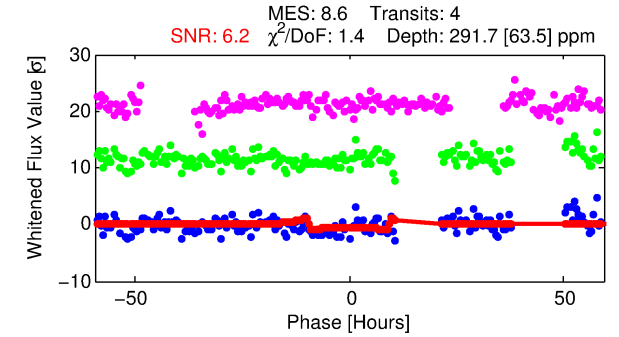
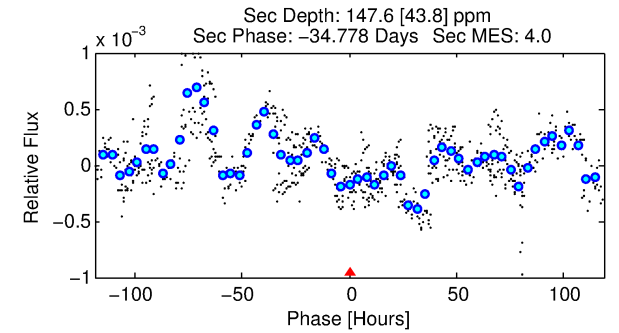
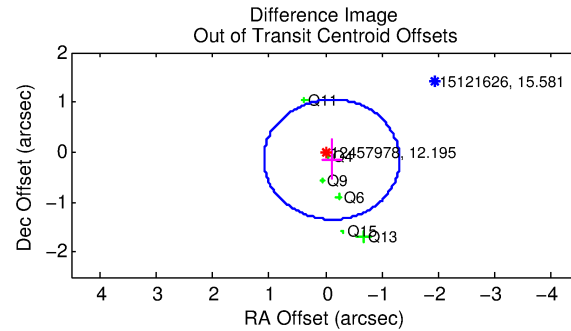
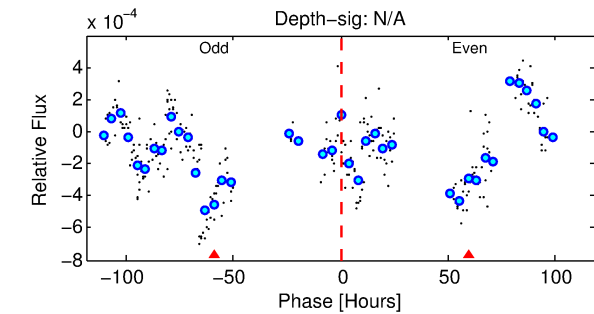
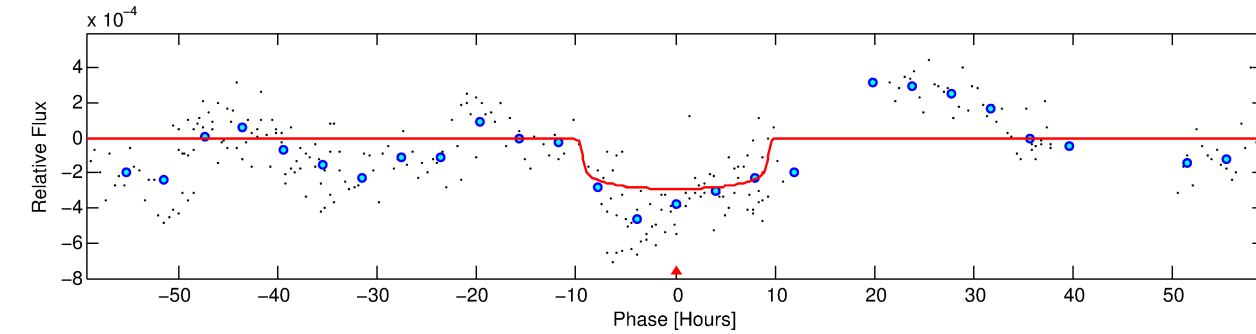
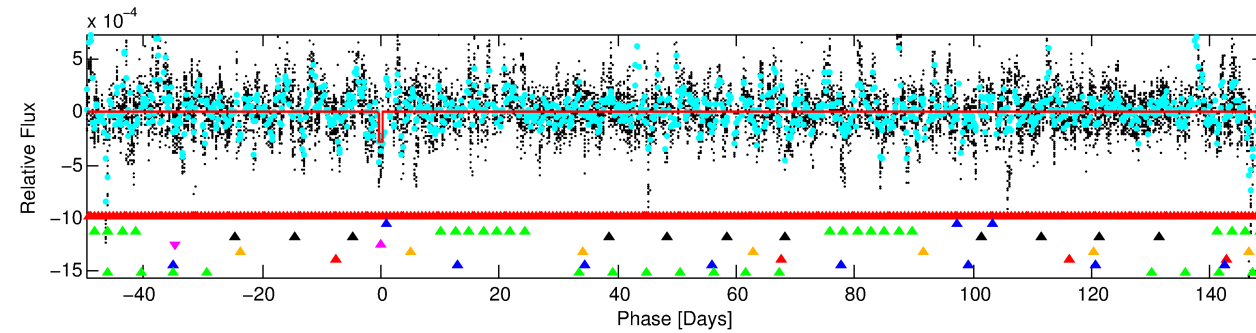
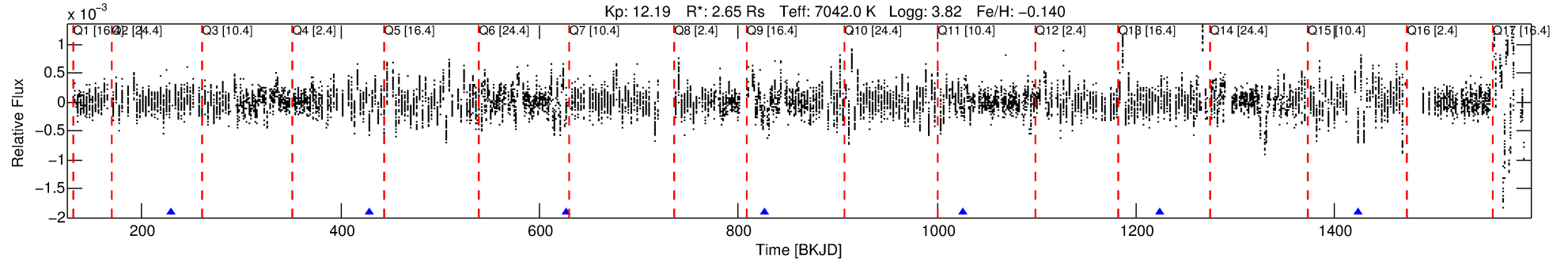
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-05

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 5 of 9 Period: 198.941 d



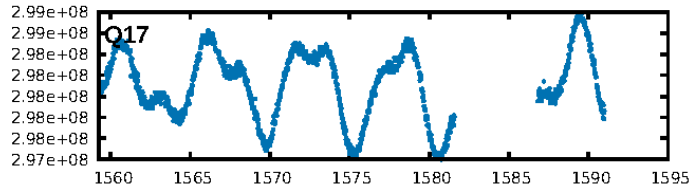
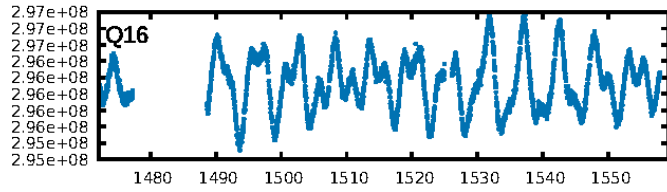
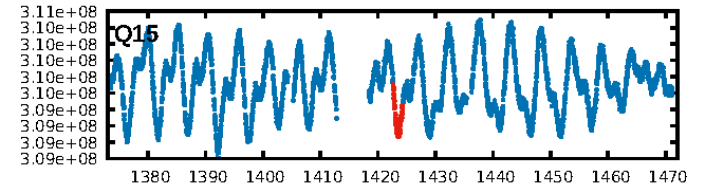
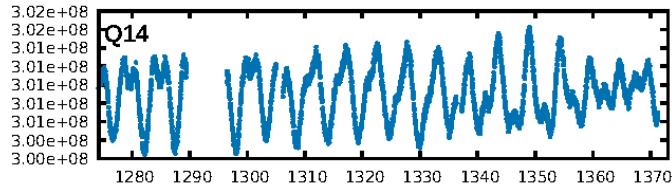
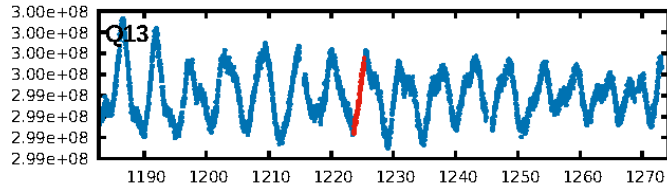
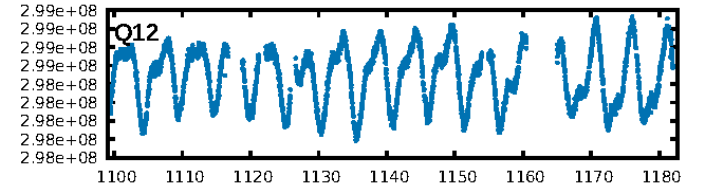
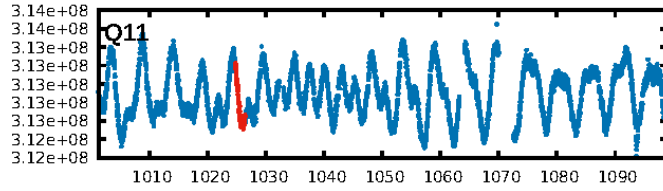
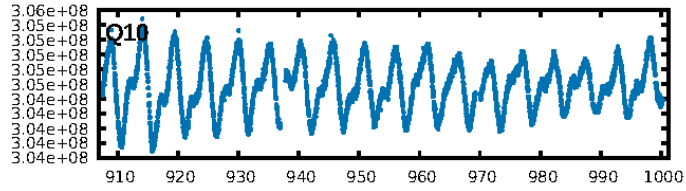
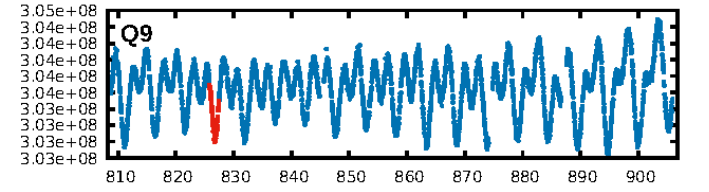
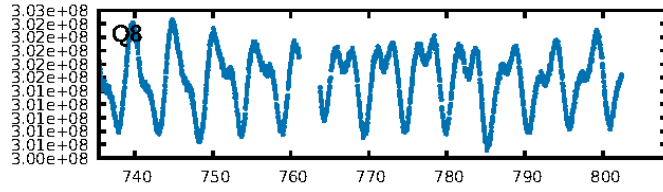
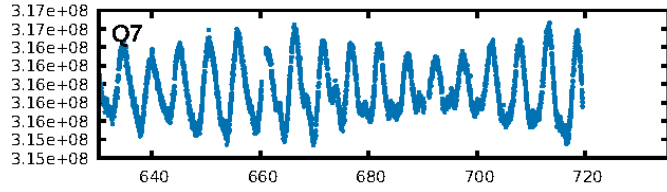
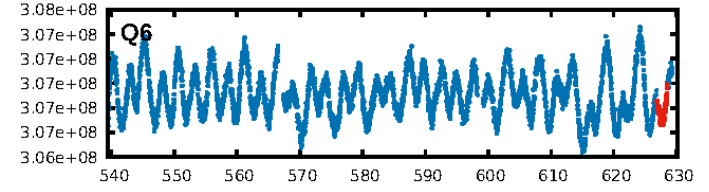
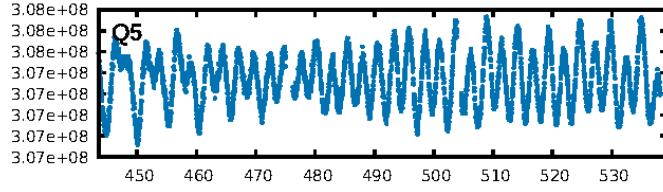
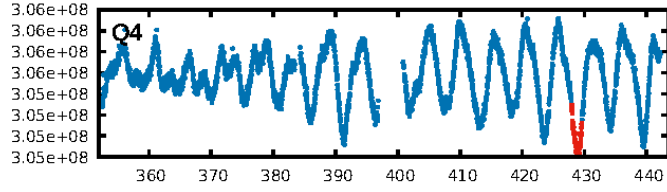
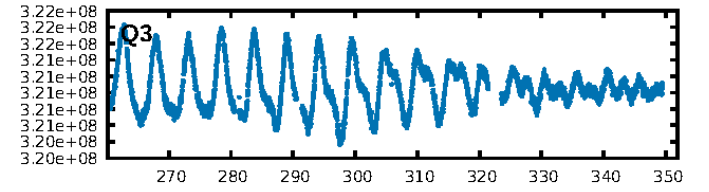
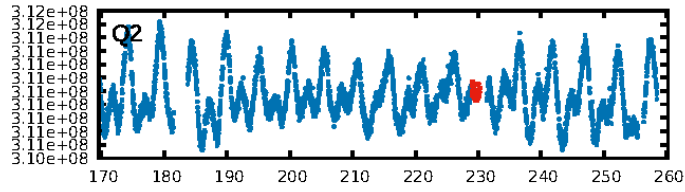
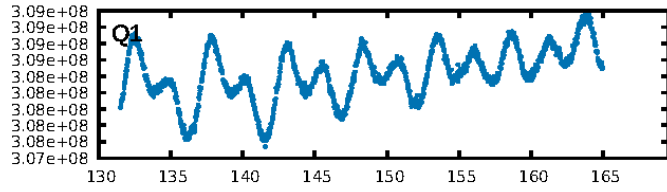
DV Fit Results:

Period = 198.94146 [0.00783] d
Epoch = 229.8174 [0.0342] BKJD
Rp/R* = 0.0174 [0.0029]
a/R* = 46.47 [28.73]
b = 0.82 [0.25]
Seff = 24.42 [12.70]
Teff = 567 [74] K
Rp = 5.04 [2.03] Re
a = 0.7966 [0.2612] AU
Ag = 2032.16 [1368.30] [1.48σ]
Teffp = 5884 [693] K [7.63σ]

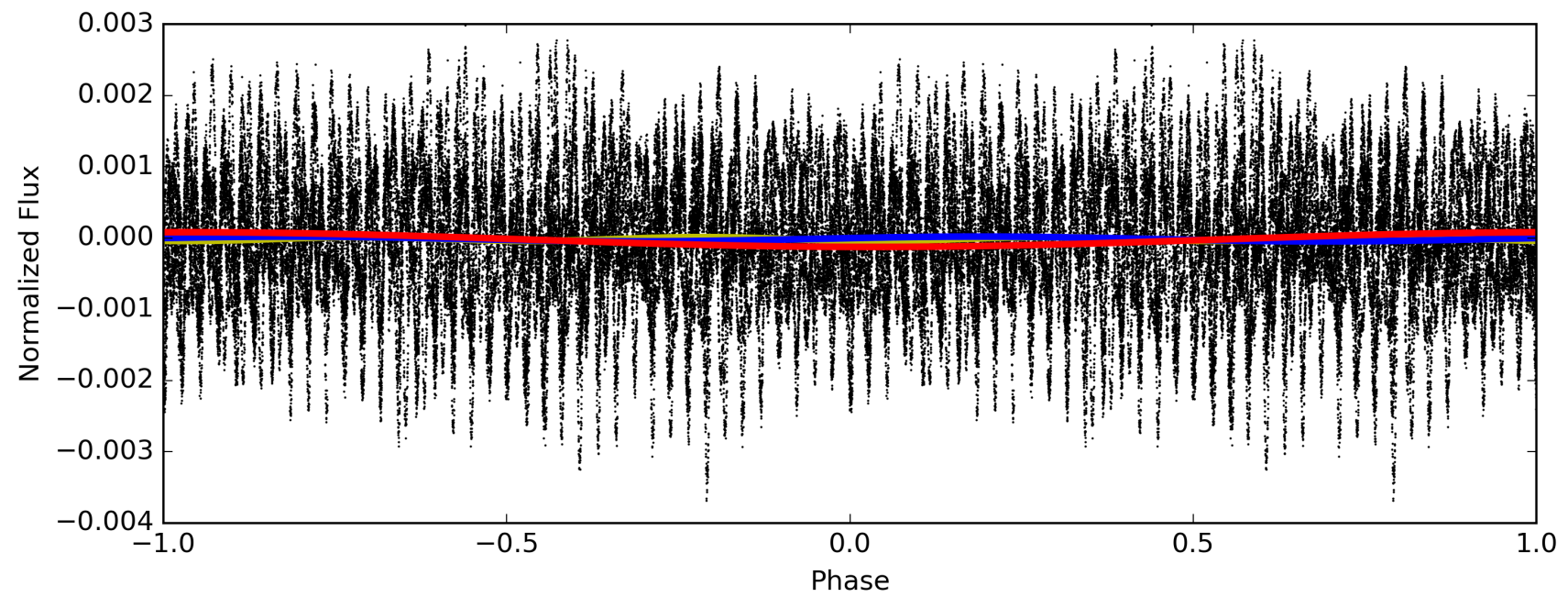
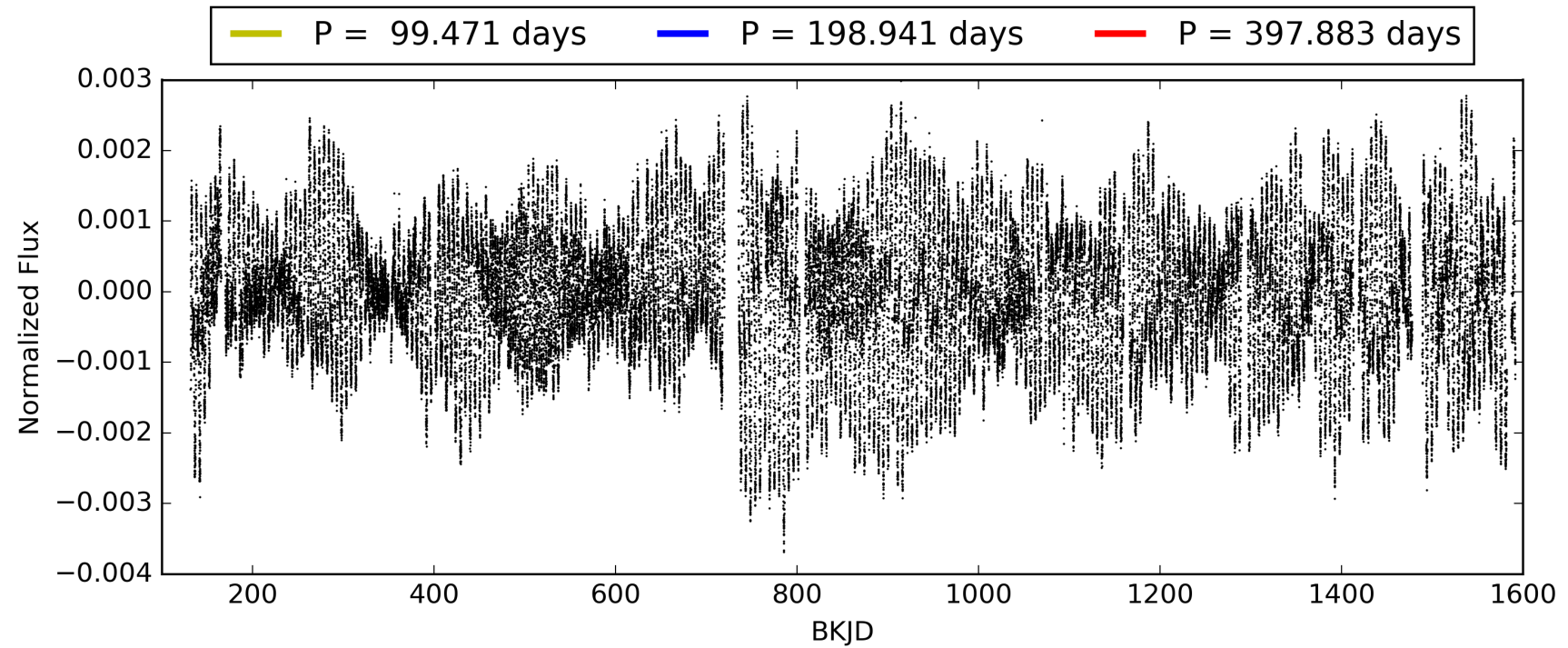
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.96σ]
LongPeriod-sig: 100.0% [26.06σ]
ModelChiSquare2-sig: 43.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.79e-07
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.4214
Centroid-sig: 1.1%
Centroid-so: 0.880 arcsec [1.56σ]
OotOffset-rm: 0.184 arcsec [0.46σ]
KicOffset-rm: 0.406 arcsec [1.25σ]
OotOffset-st: 1/2/1/2 [6]
KicOffset-st: 1/2/1/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 0.00 [0/6]

TCE 012457978-05, PDC Light Curves

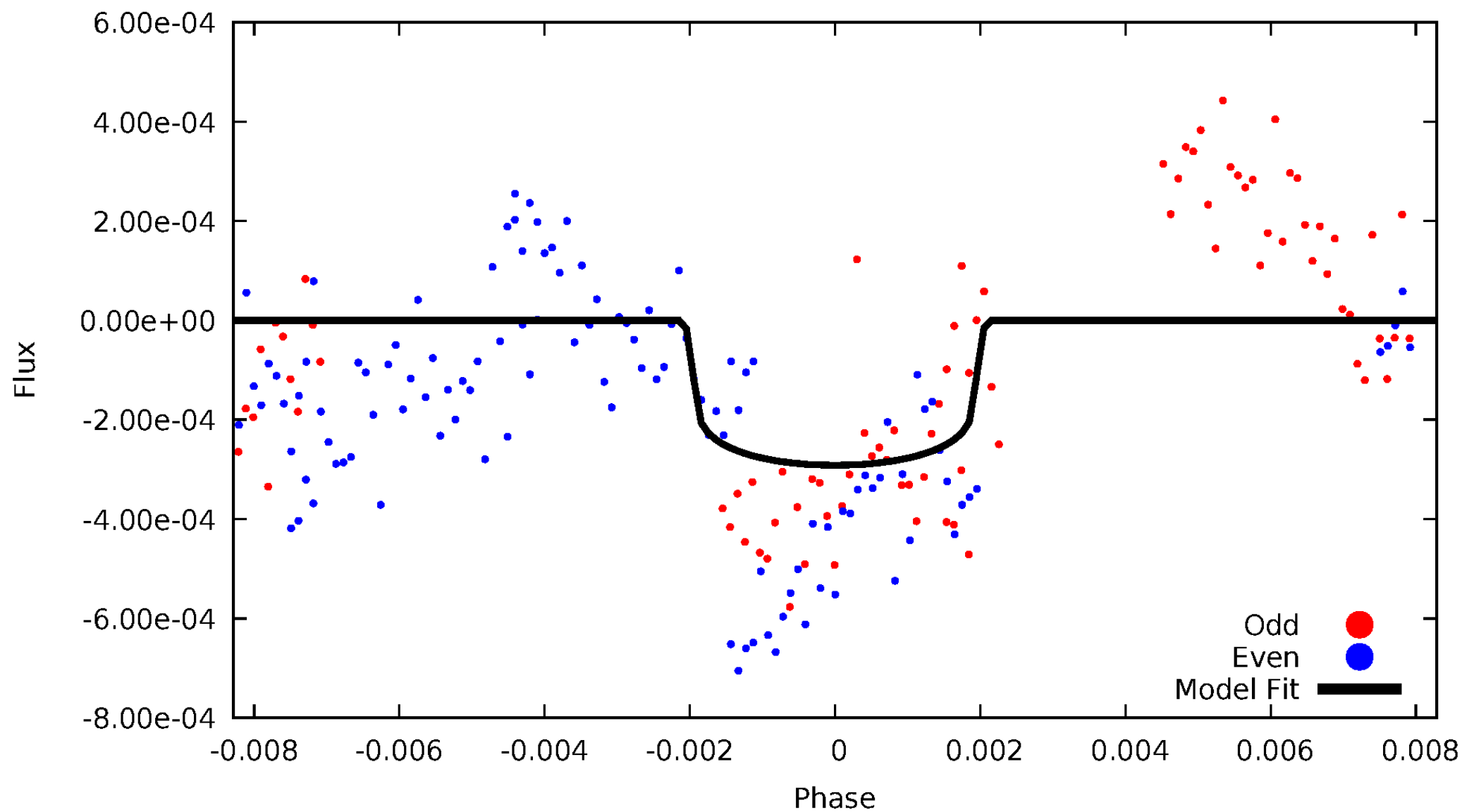


TCE 012457978-05



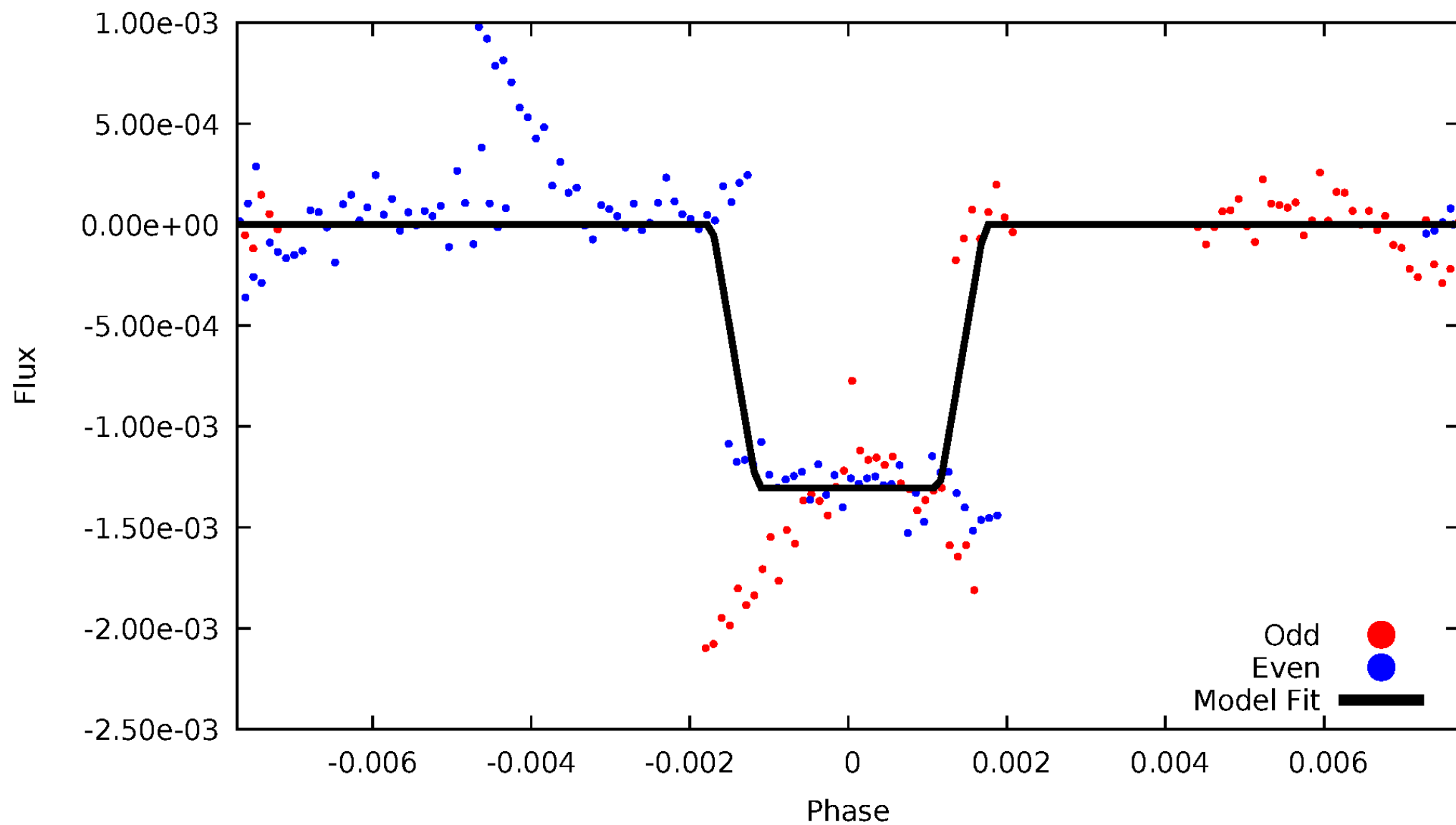
DV Odd/Even

TCE 012457978-05



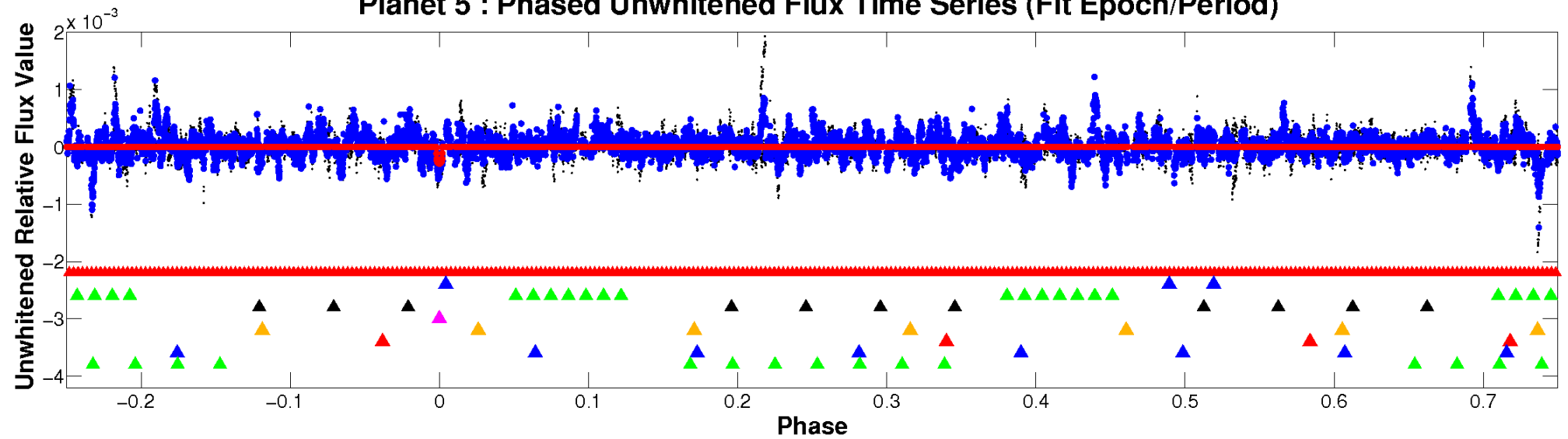
ALT Odd/Even

TCE 012457978-05

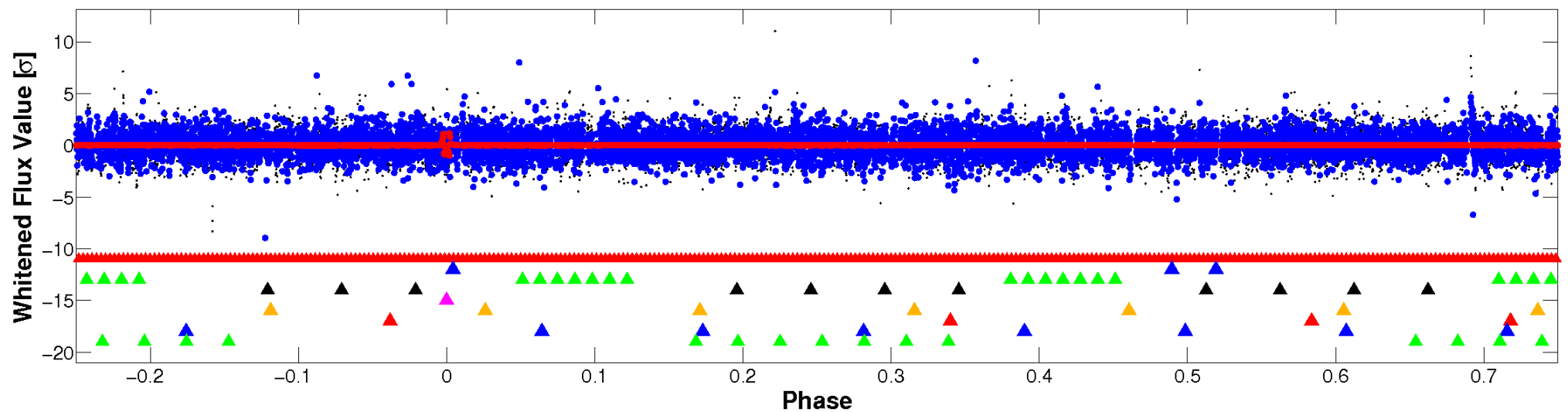


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

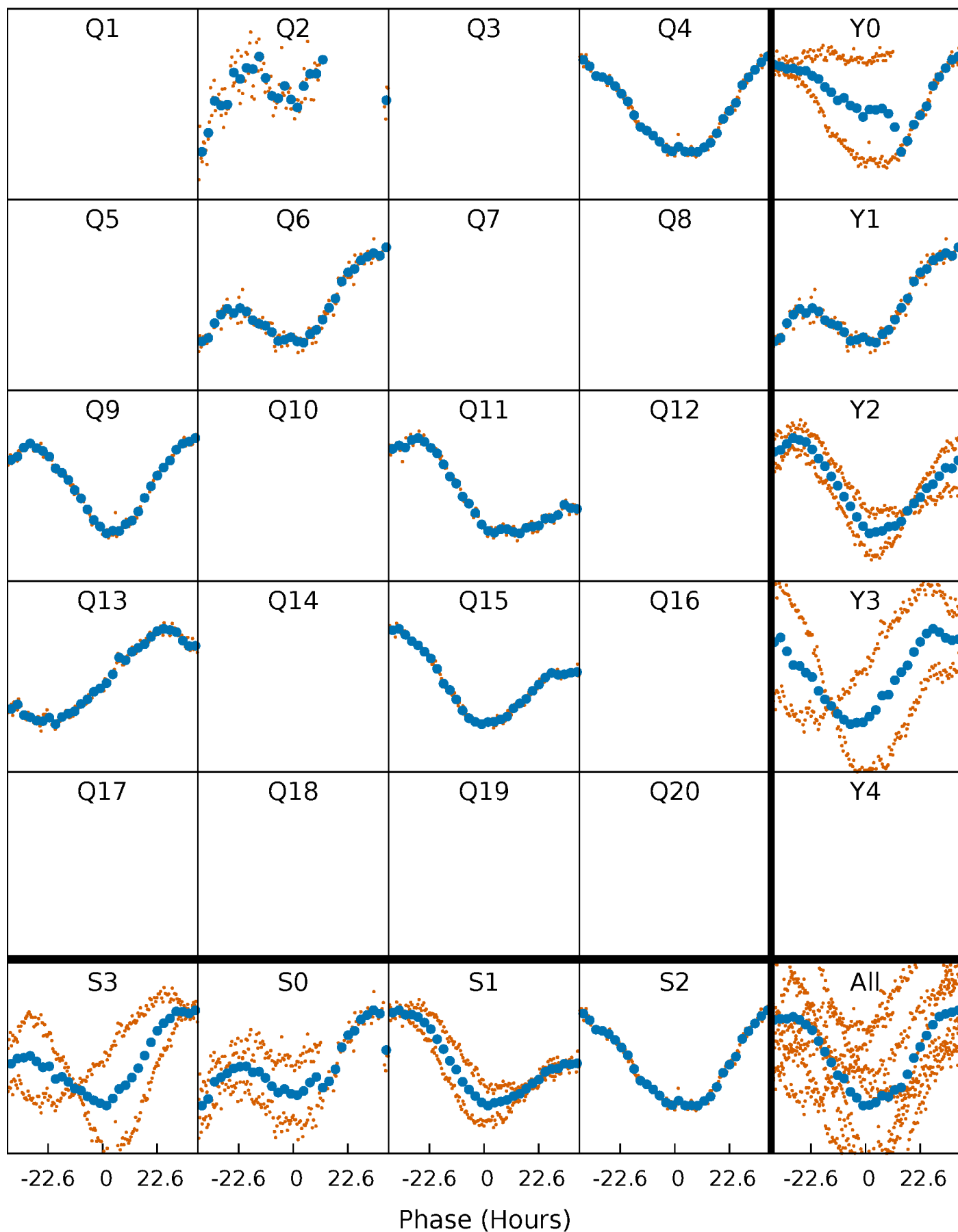


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



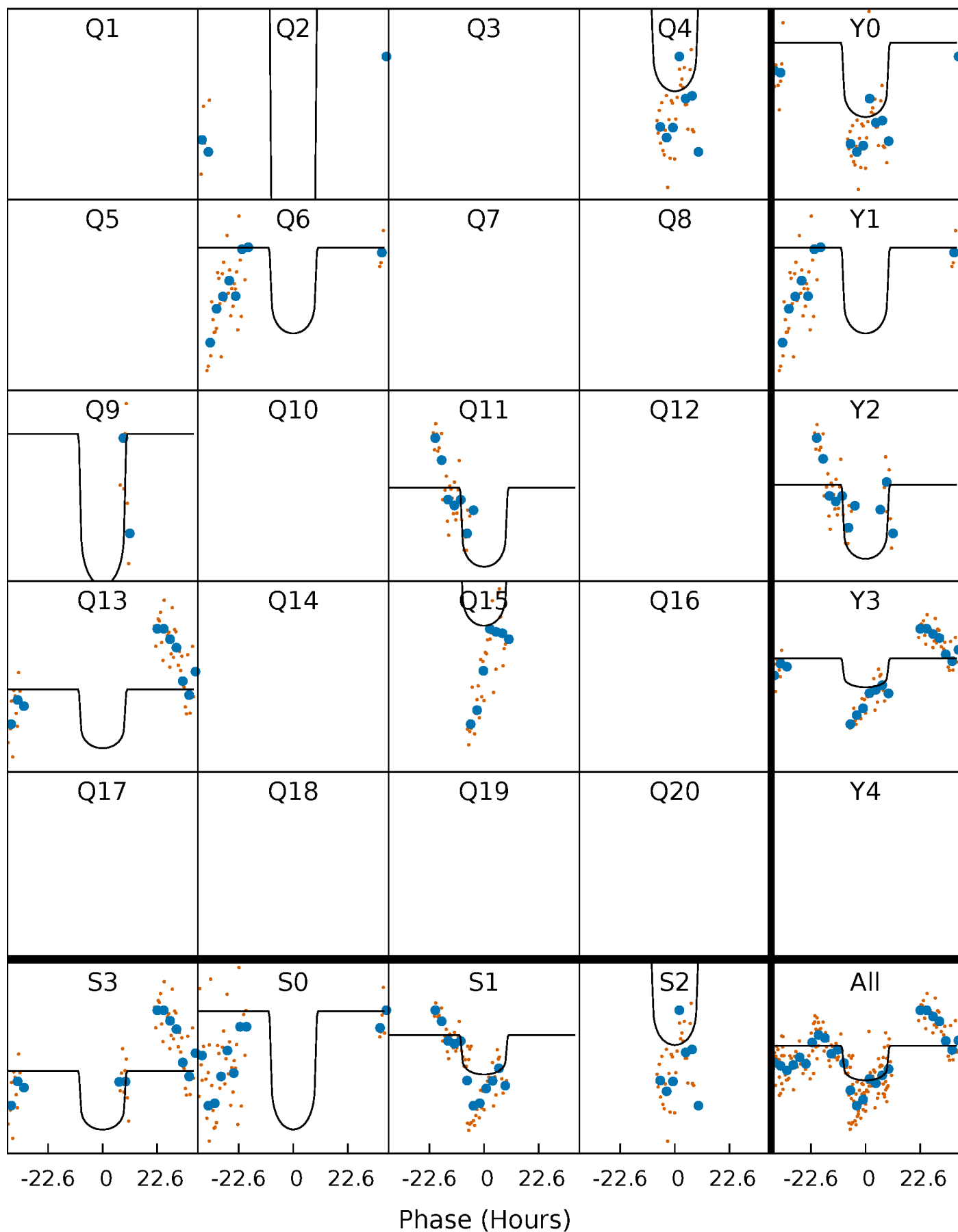
PDC Quarter-Phased Transit Curves

TCE 012457978-05 $P=198.941456$ Days $T_0=229.817443$ (BKJD)



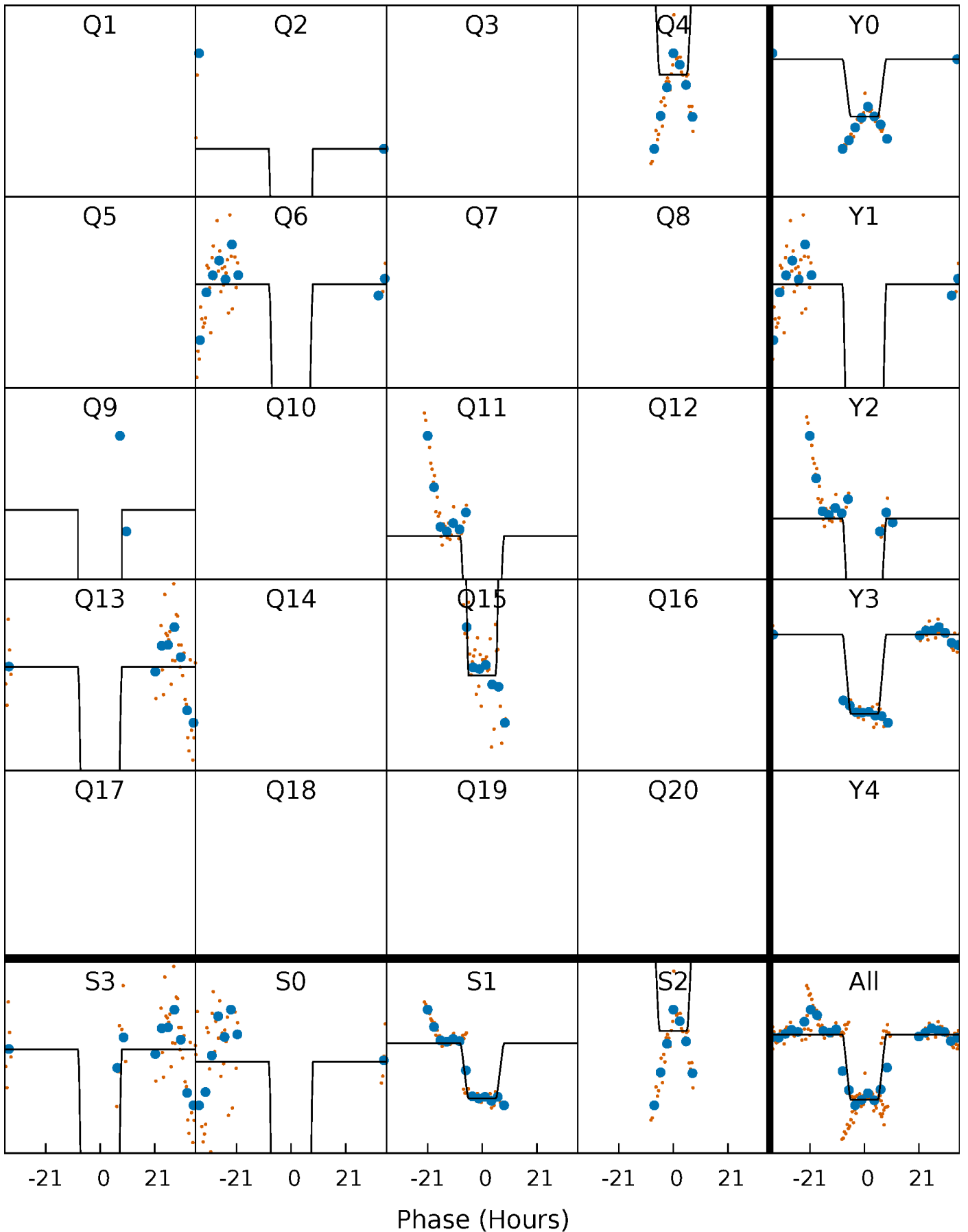
DV Quarter-Phased Transit Curves

TCE 012457978-05 $P=198.941456$ Days $T_0=229.817443$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

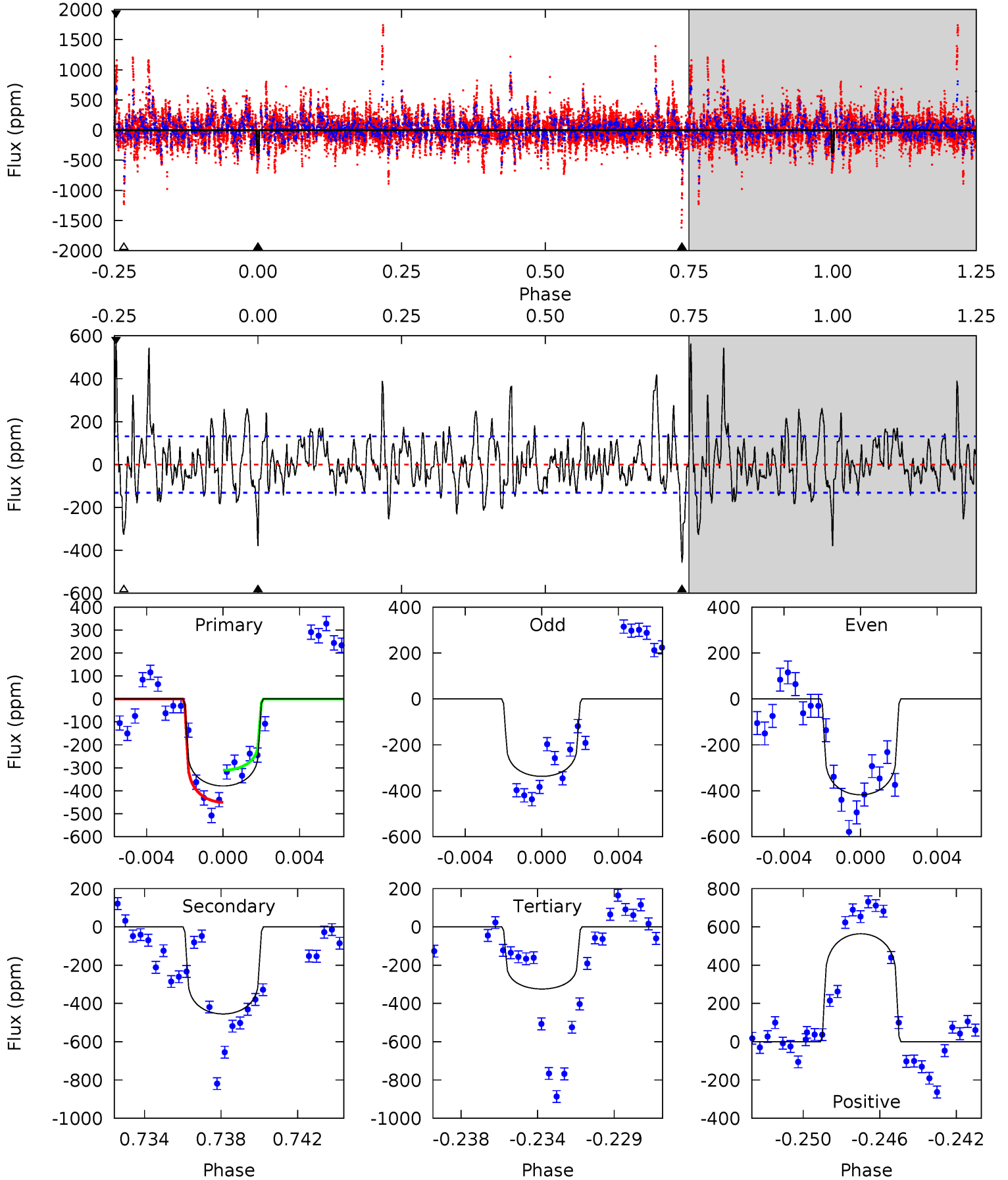
TCE 012457978-05 $P=198.934329$ Days $T_0=229.875320$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-05, P = 198.941456 Days, E = 30.875987 Days

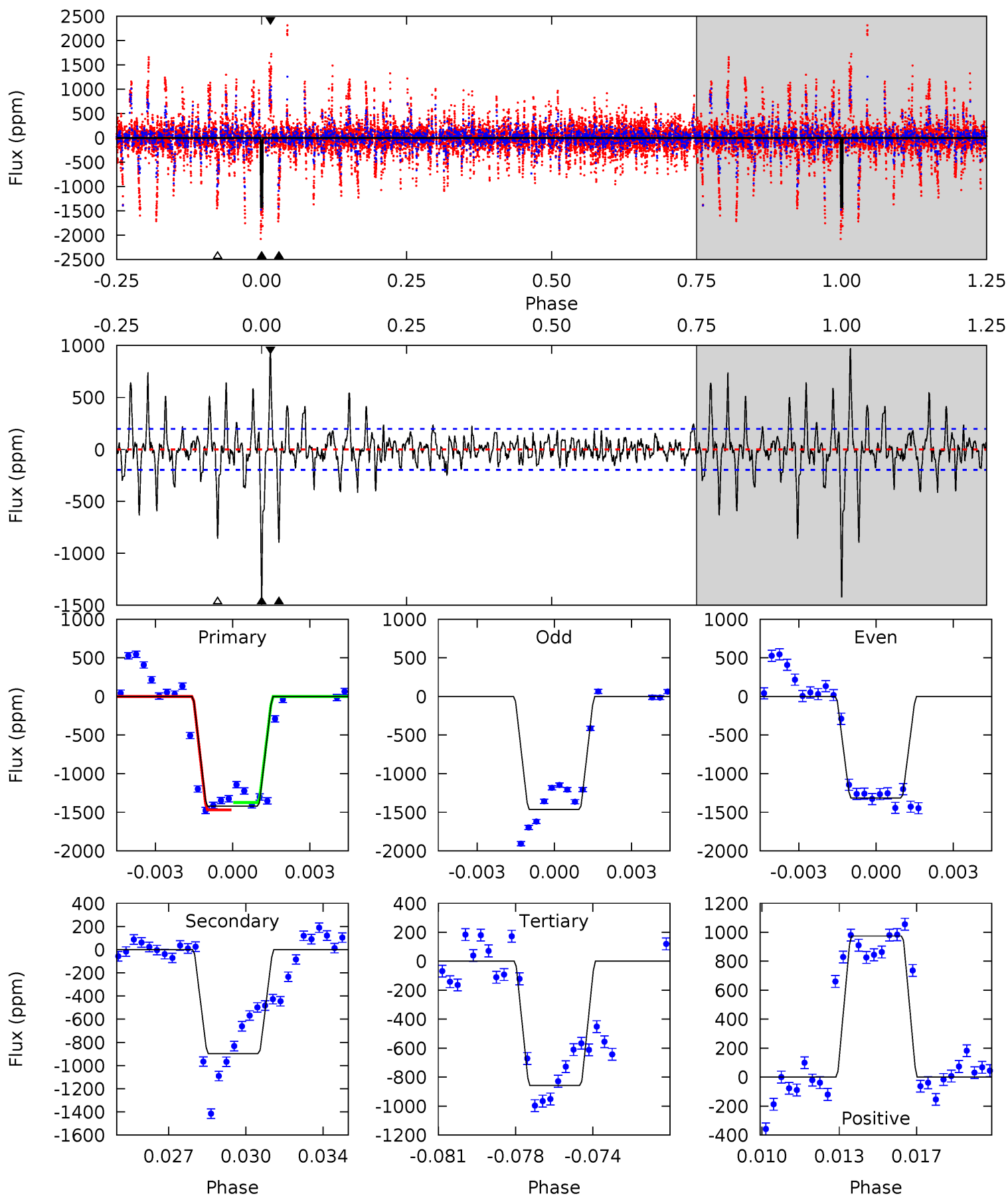
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	18.0	12.8	22.3	5.19	2.87	4.43	2.16	-7.31	5.15	-4.31	1.53	0.95	0.55	2.76



Alt Model-Shift Uniqueness Test

012457978-05, P = 198.934329 Days, E = 30.940991 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.7	23.8	22.7	25.9	5.23	2.93	4.33	15.0	11.9	1.04	-2.06	1.98	0.88	0.41	1.25



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-455 ± 25	$4.79^{+1.19}_{-1.06}$	779^{+45}_{-69}	7902^{+941}_{-807}	6908^{+4016}_{-2470}
Alt.	-896 ± 38	$10.13^{+1.58}_{-2.08}$	780^{+48}_{-73}	6343^{+365}_{-301}	3044^{+1534}_{-745}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

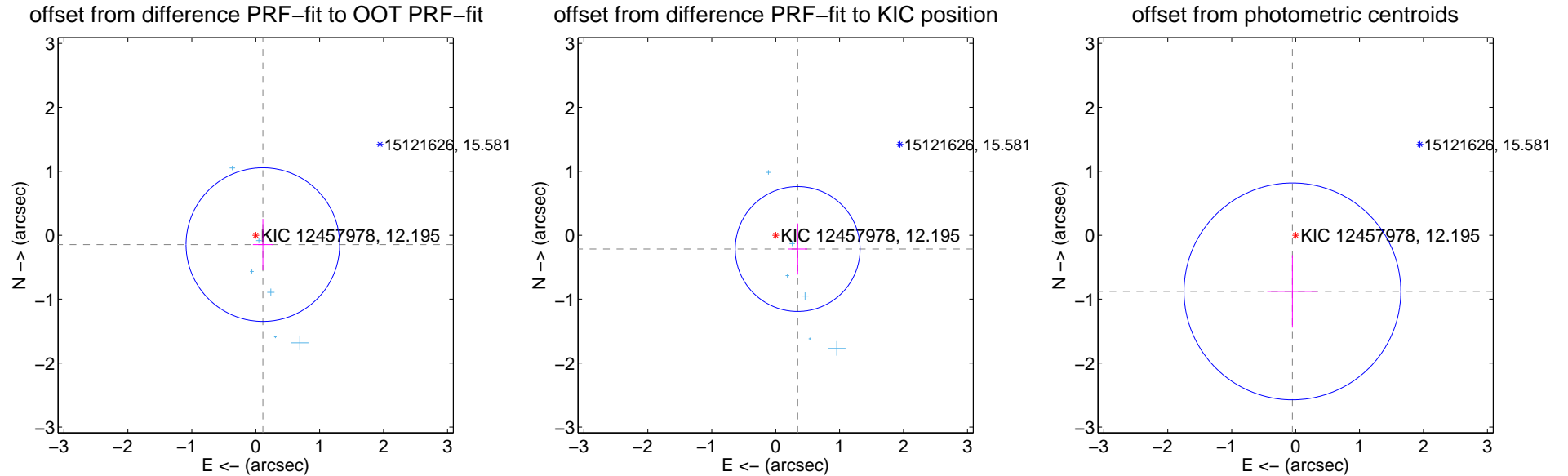
DV Centroid Data

Supplemental centroid analysis for 012457978-05. Kepler magnitude: 12.20. Transit SNR 6.24

There are 6 quarters with good PRF difference image offsets

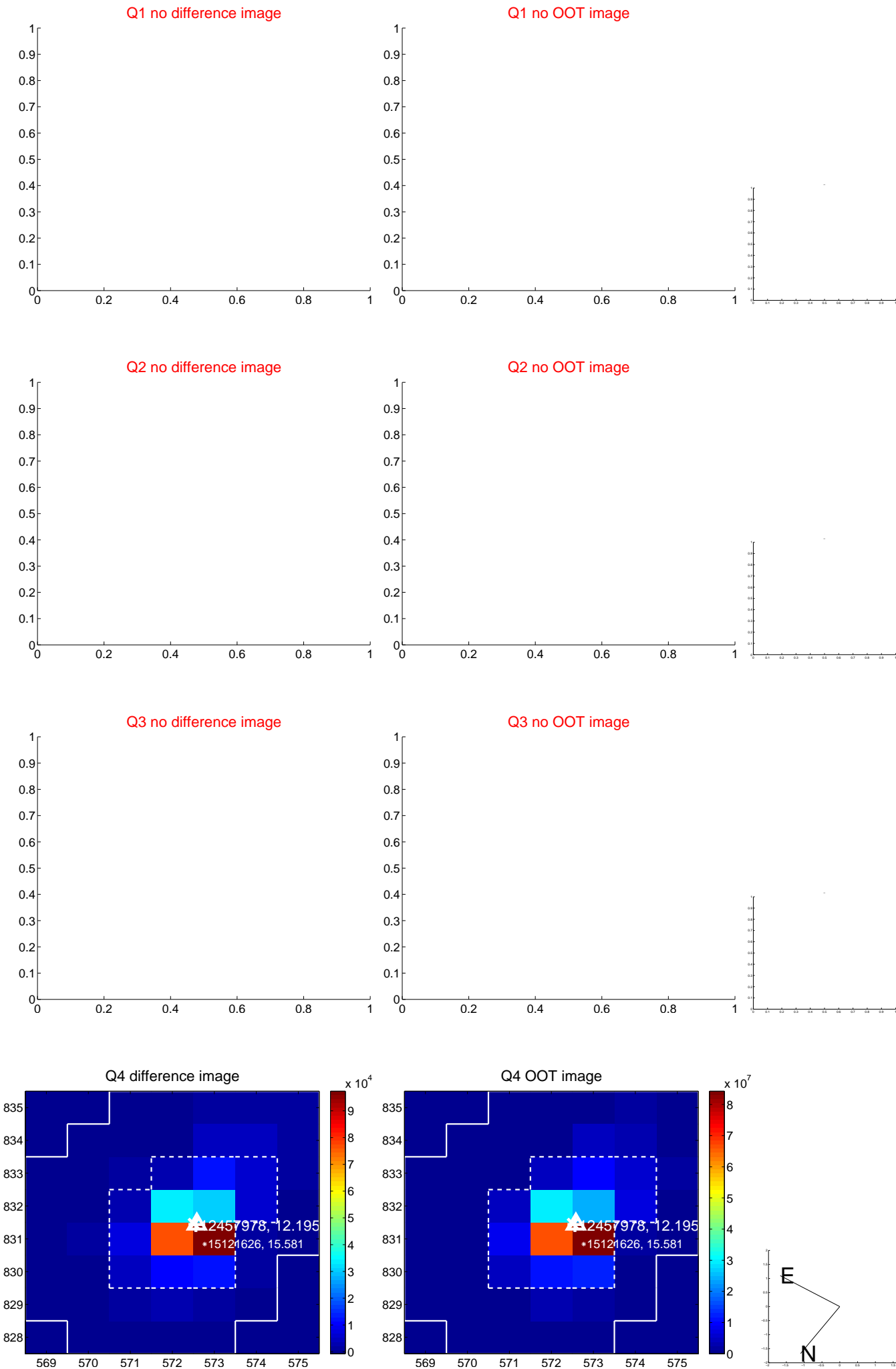
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.184 ± 0.401	0.46	-0.112 ± 0.156	-0.146 ± 0.401
PRF-fit source offset from KIC position	0.406 ± 0.326	1.25	-0.344 ± 0.150	-0.215 ± 0.400
photometric centroid source offset	0.88 ± 0.57	1.56	0.05 ± 0.39	-0.88 ± 0.57

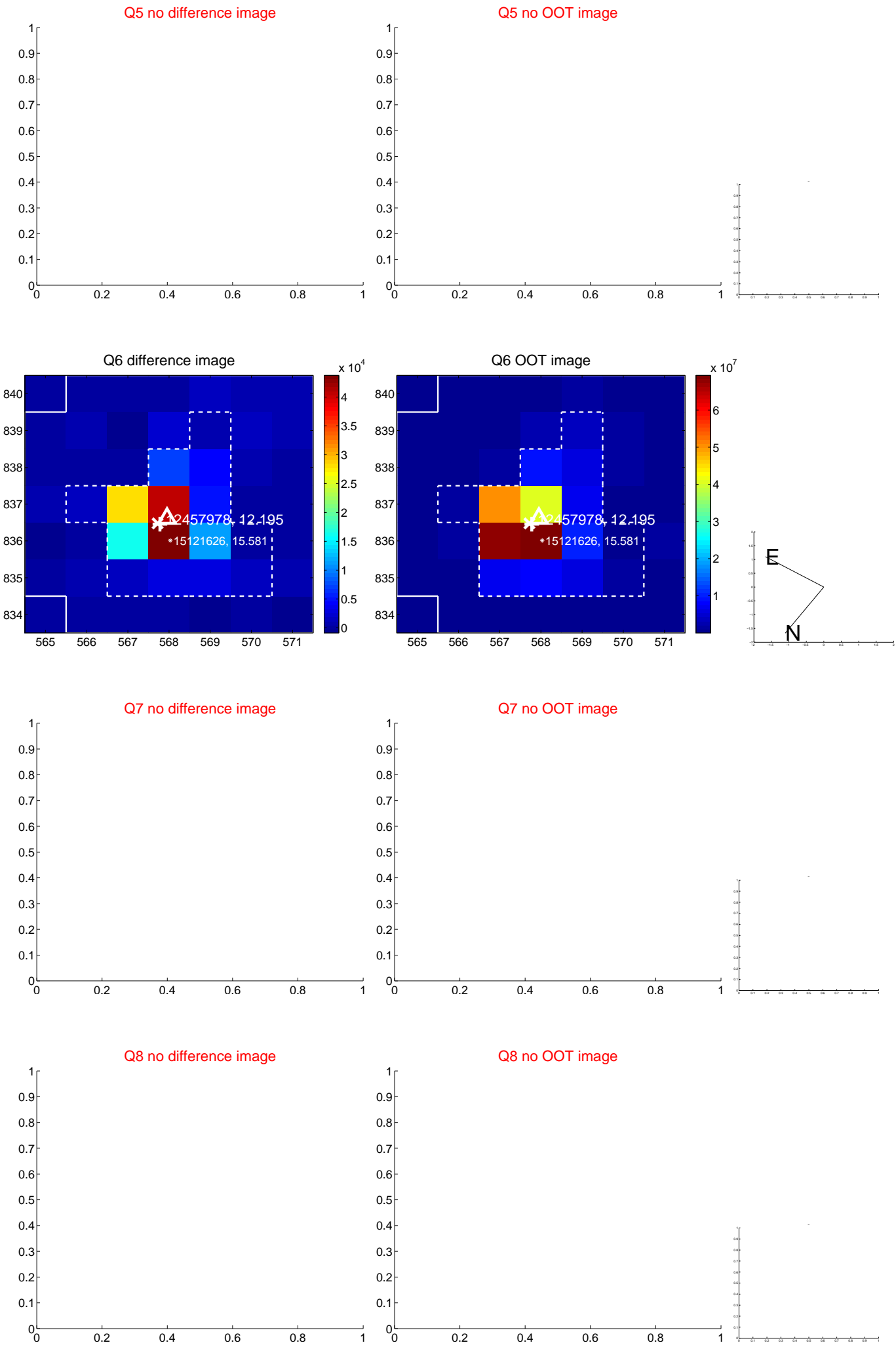


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

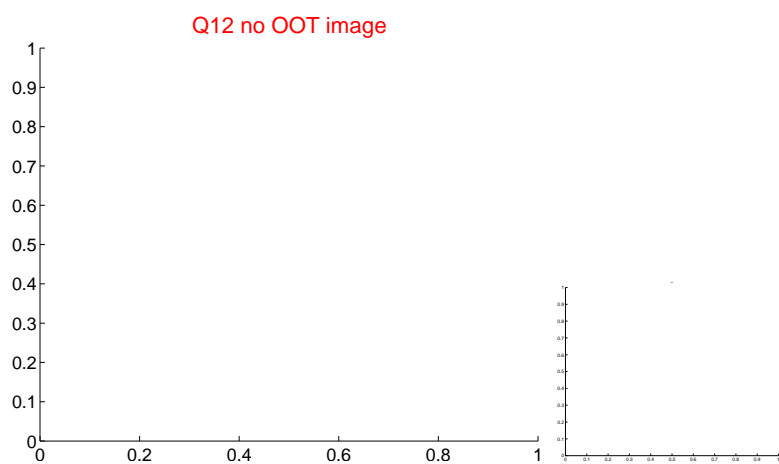
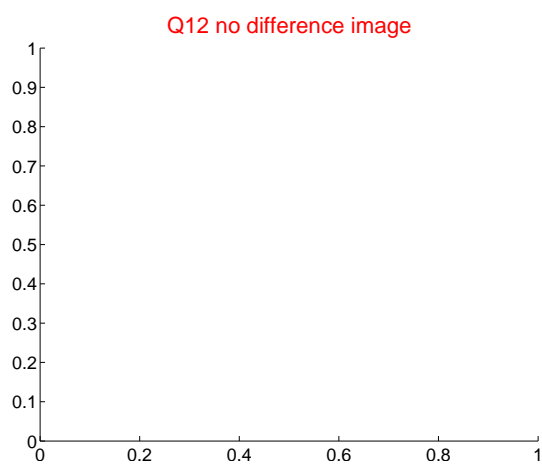
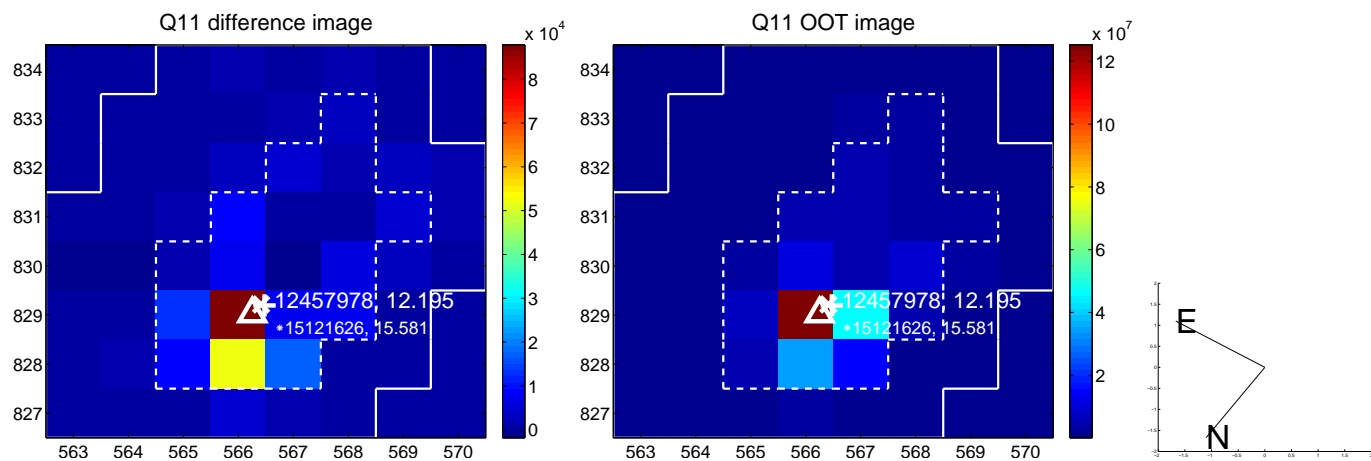
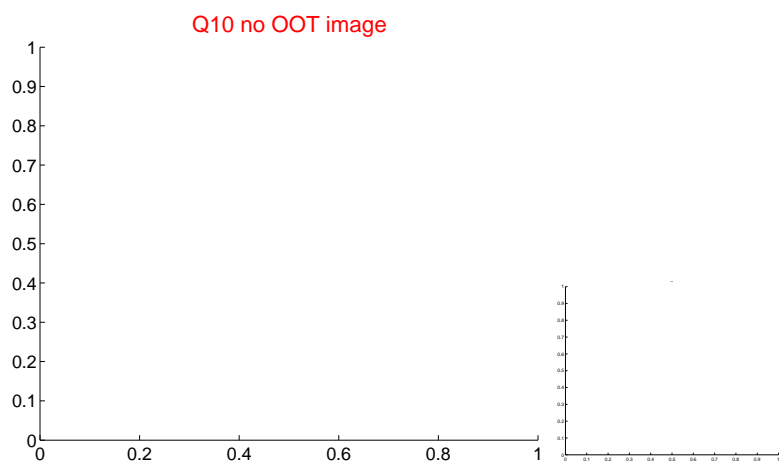
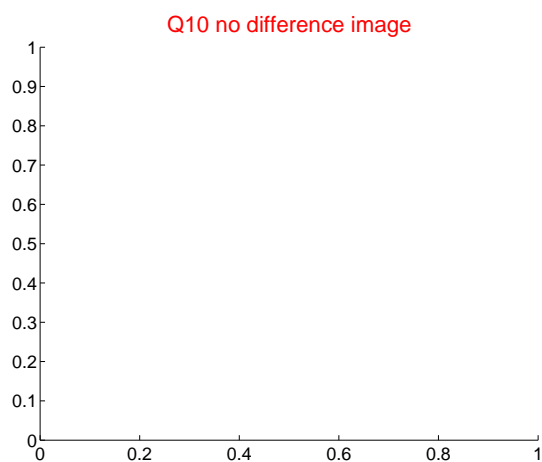
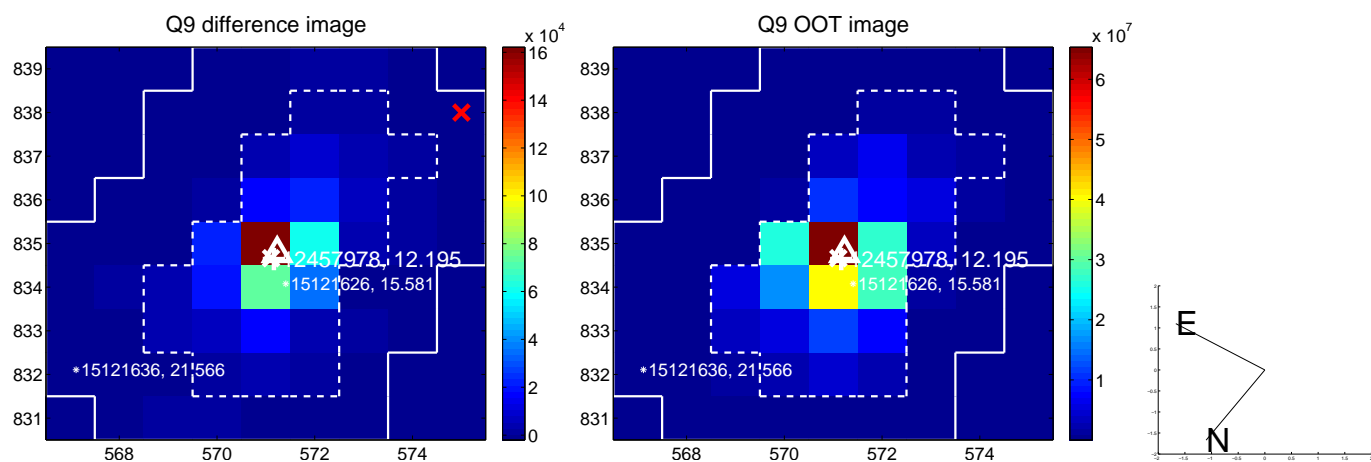
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



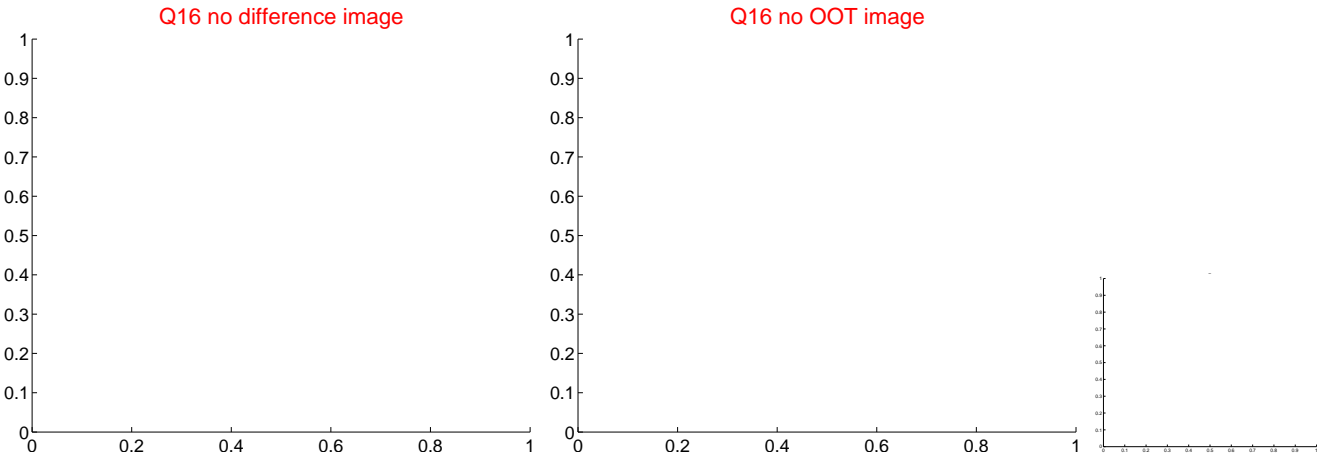
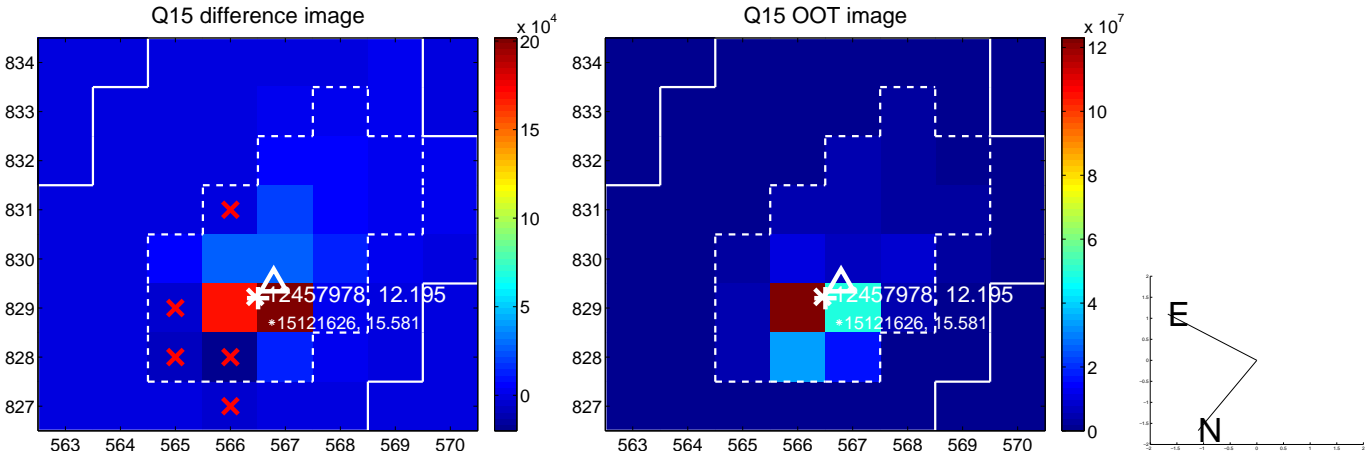
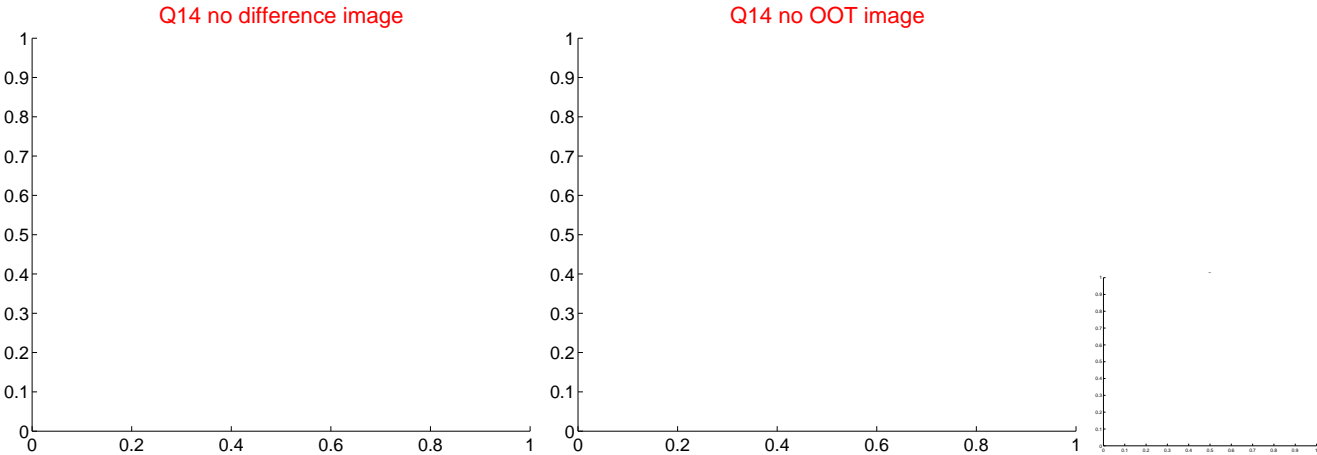
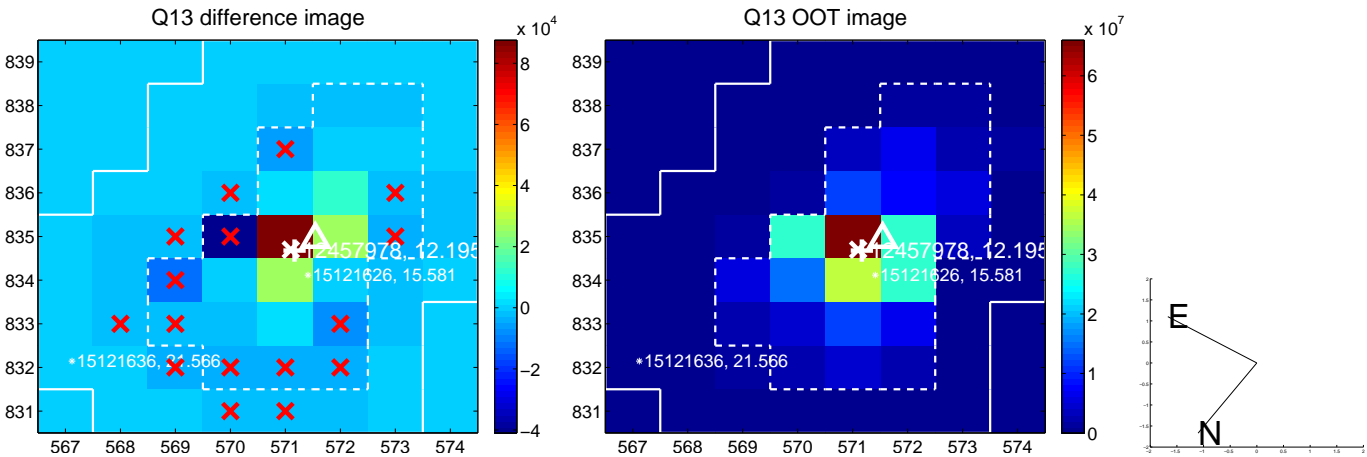
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



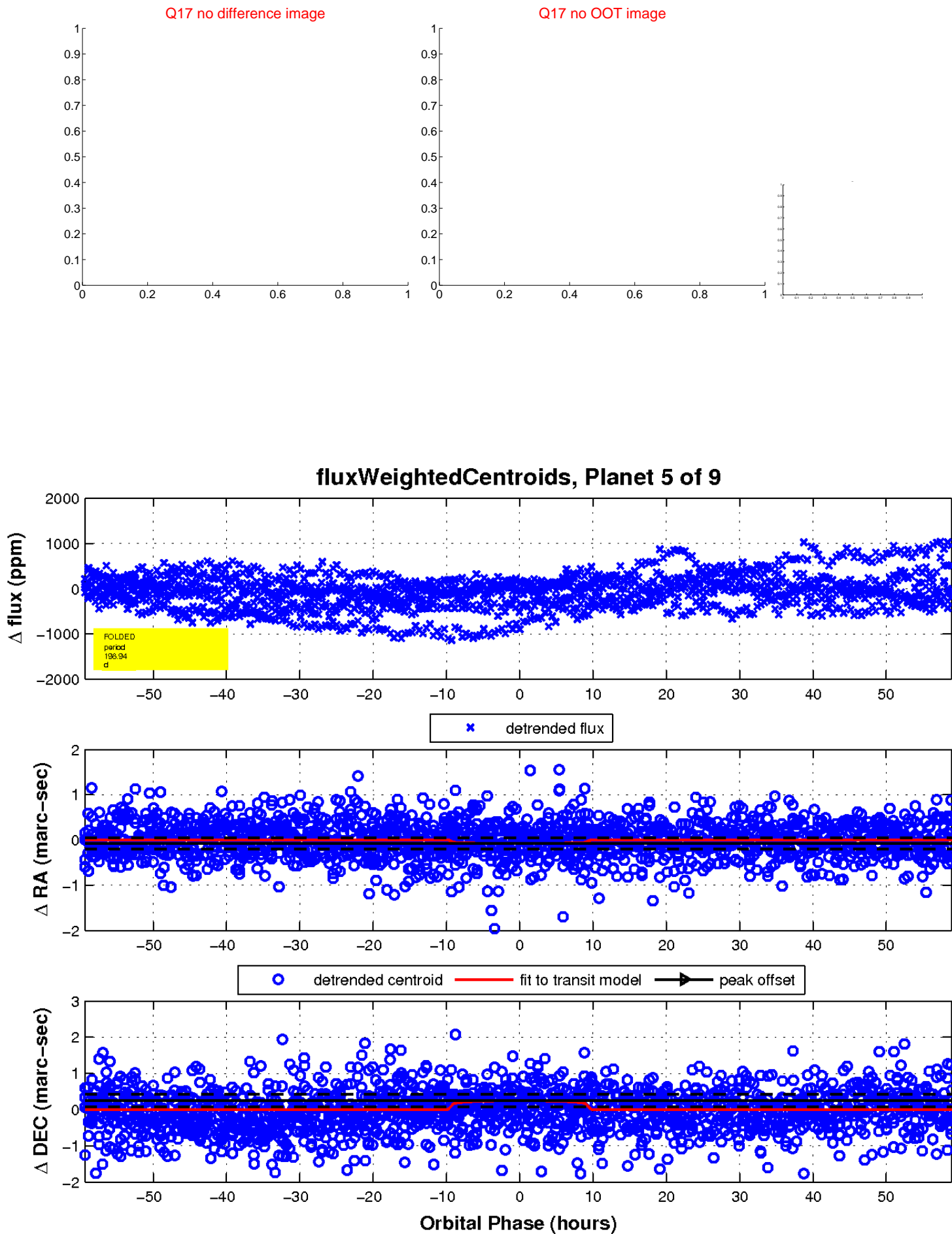
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

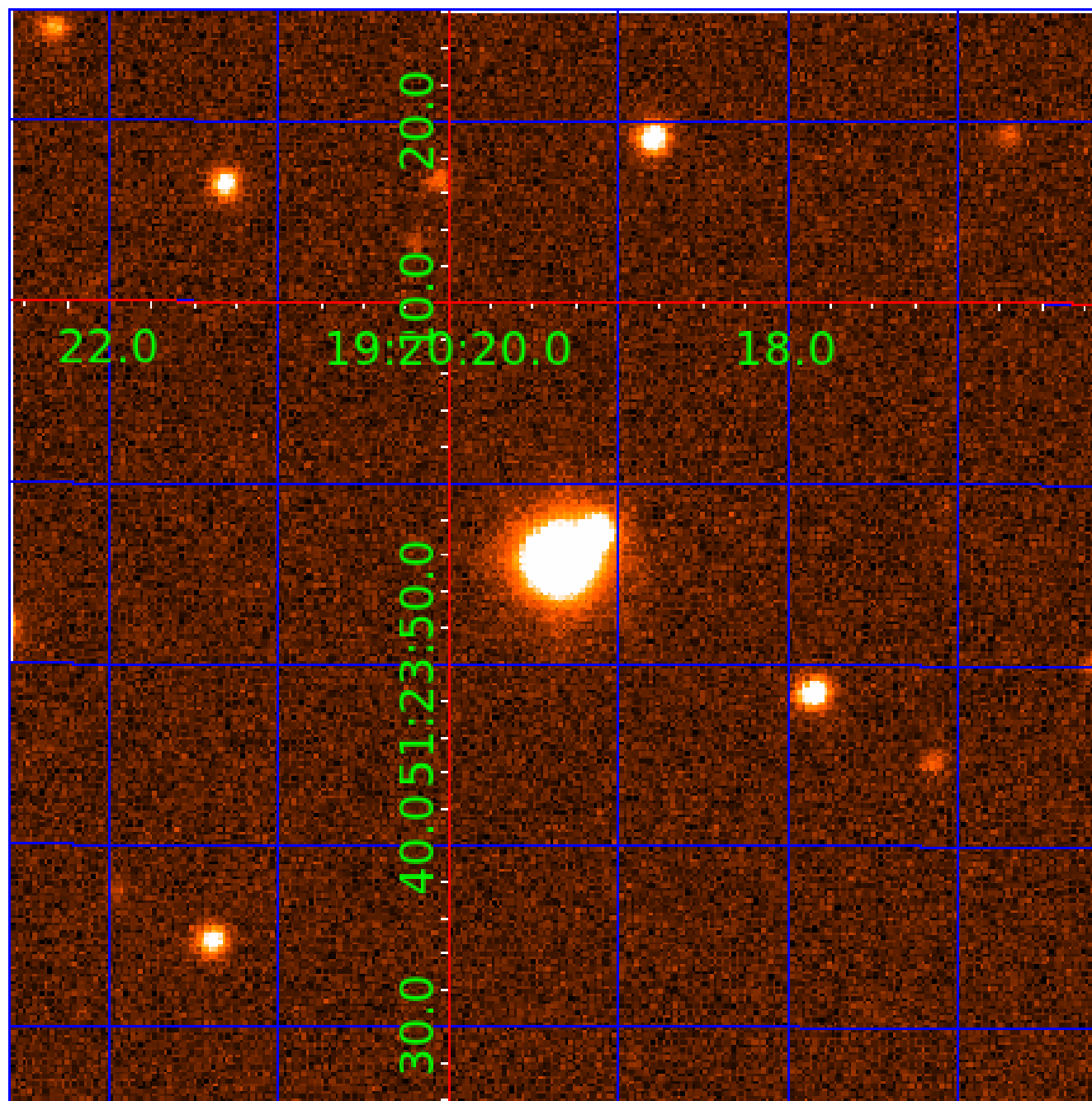


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

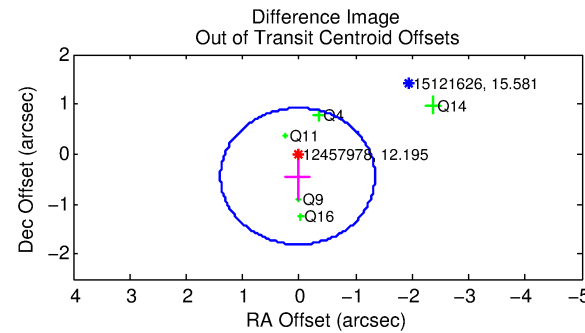
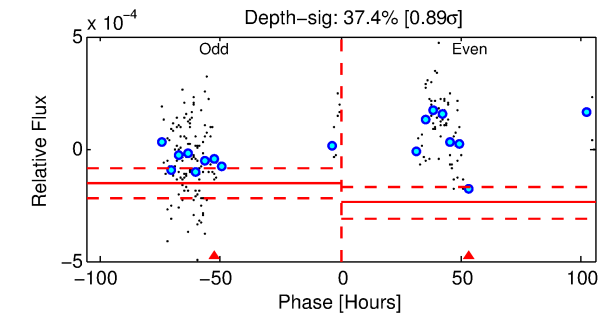
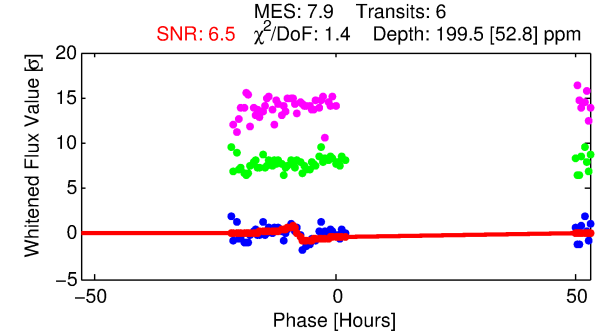
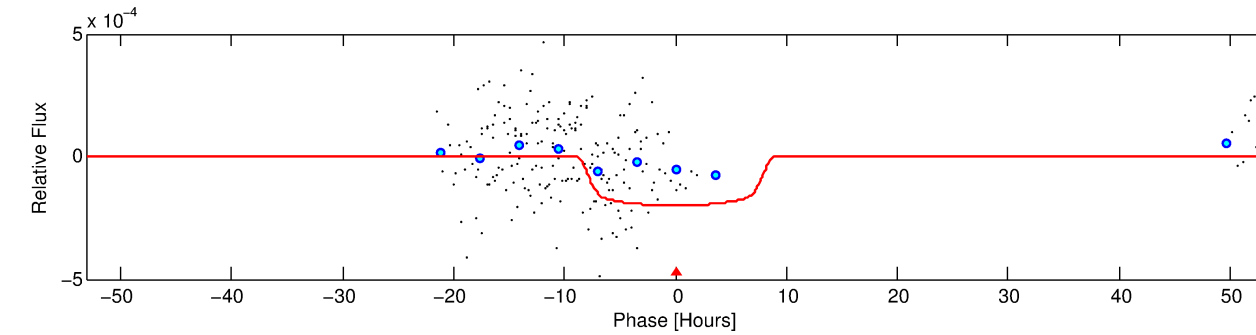
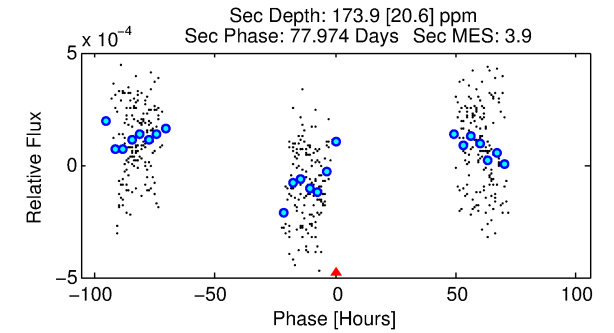
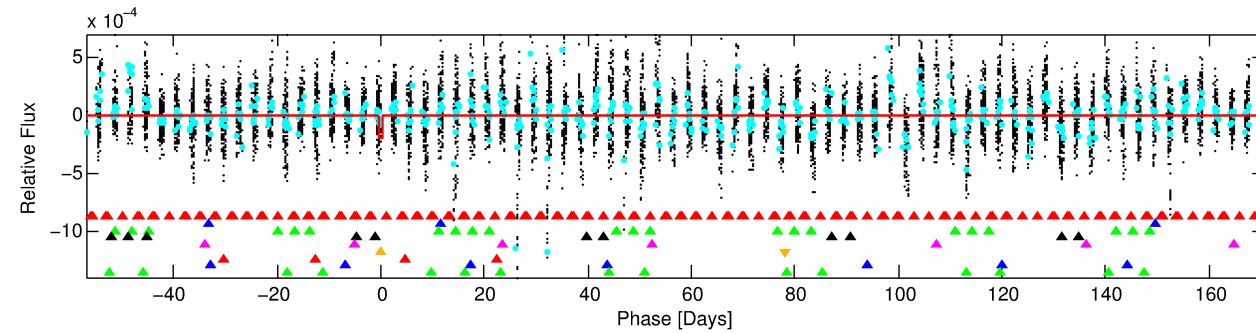
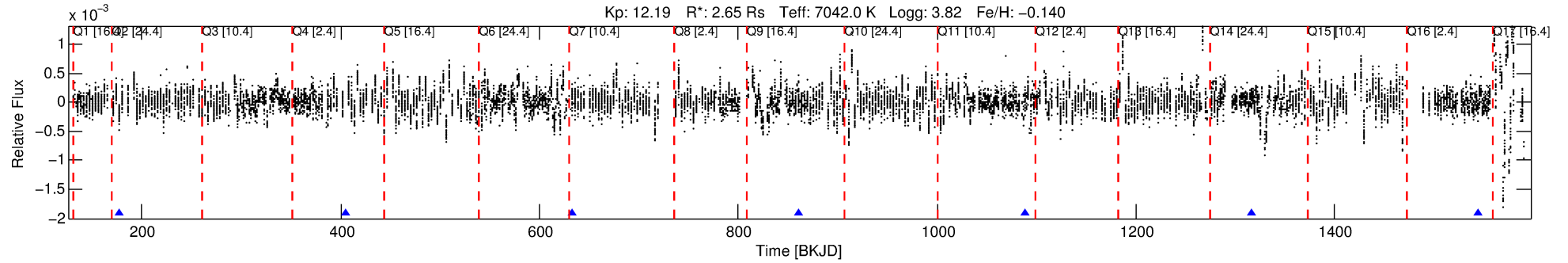
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-06

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 6 of 9 Period: 227.755 d



DV Fit Results:

Period = 227.75476 [0.00612] d
Epoch = 177.3863 [0.1417] BKJD
Rp/R* = 0.0156 [0.0020]
a/R* = 38.84 [11.71]
b = 0.94 [0.06]
Seff = 20.39 [10.61]
Teff = 542 [70] K
Rp = 4.51 [1.75] Re
a = 0.8717 [0.2859] AU
Ag = 3571.67 [2047.00] [1.74 σ]
Teffp = 6477 [504] K [11.66 σ]

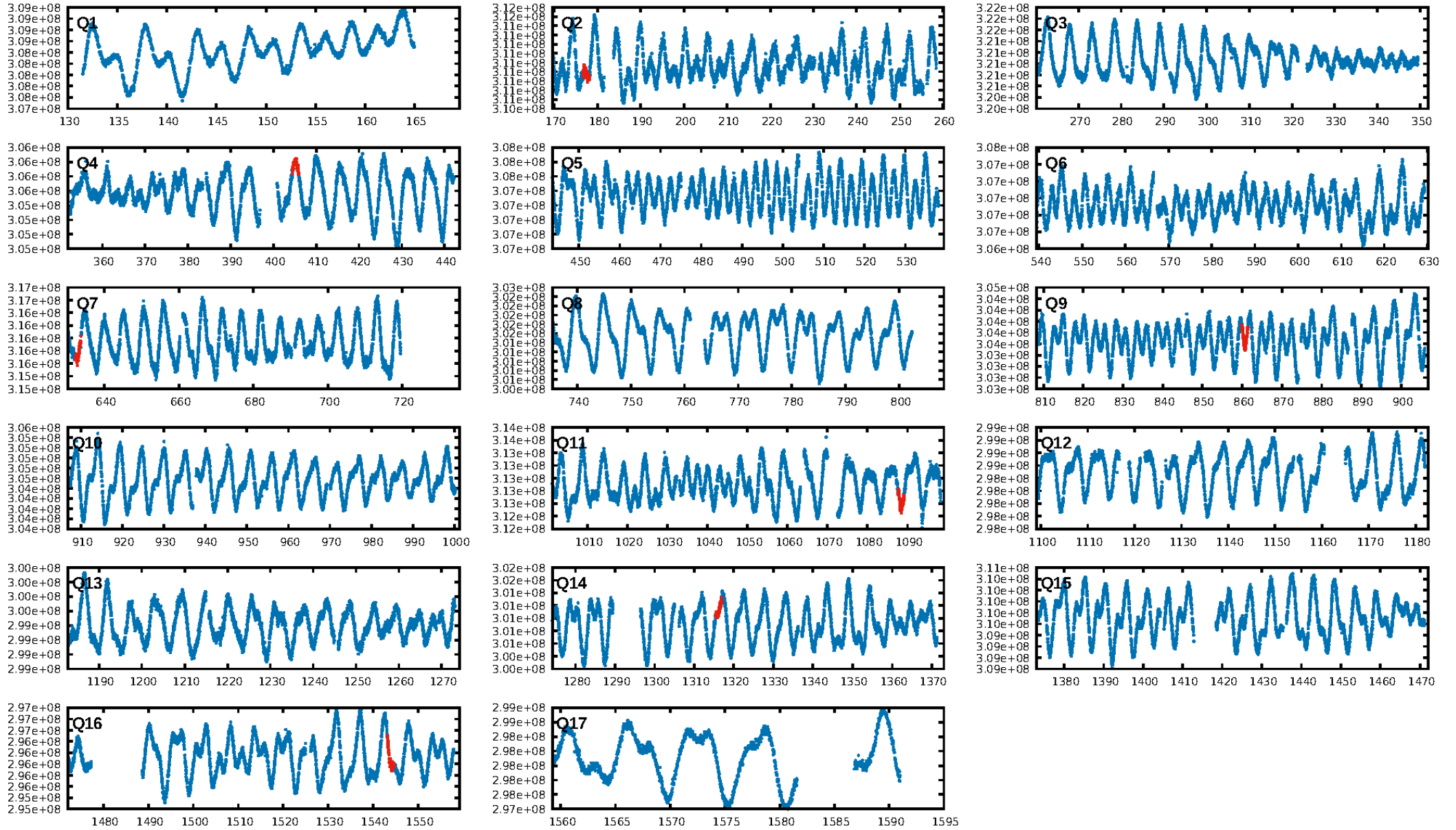
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [26.06 σ]
LongPeriod-sig: 100.0% [158.38 σ]
ModelChiSquare2-sig: 59.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.07e-08
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 0.9612
Centroid-sig: 93.7%
Centroid-so: 0.361 arcsec [0.56 σ]
OotOffset-rm: 0.443 arcsec [0.97 σ]
KicOffset-rm: 0.545 arcsec [1.23 σ]
OotOffset-st: 1/1/2/1 [5]
KicOffset-st: 1/1/2/1 [5]
DiffImageQuality-fgm: 0.80 [4/5]
DiffImageOverlap-fno: 0.00 [0/6]

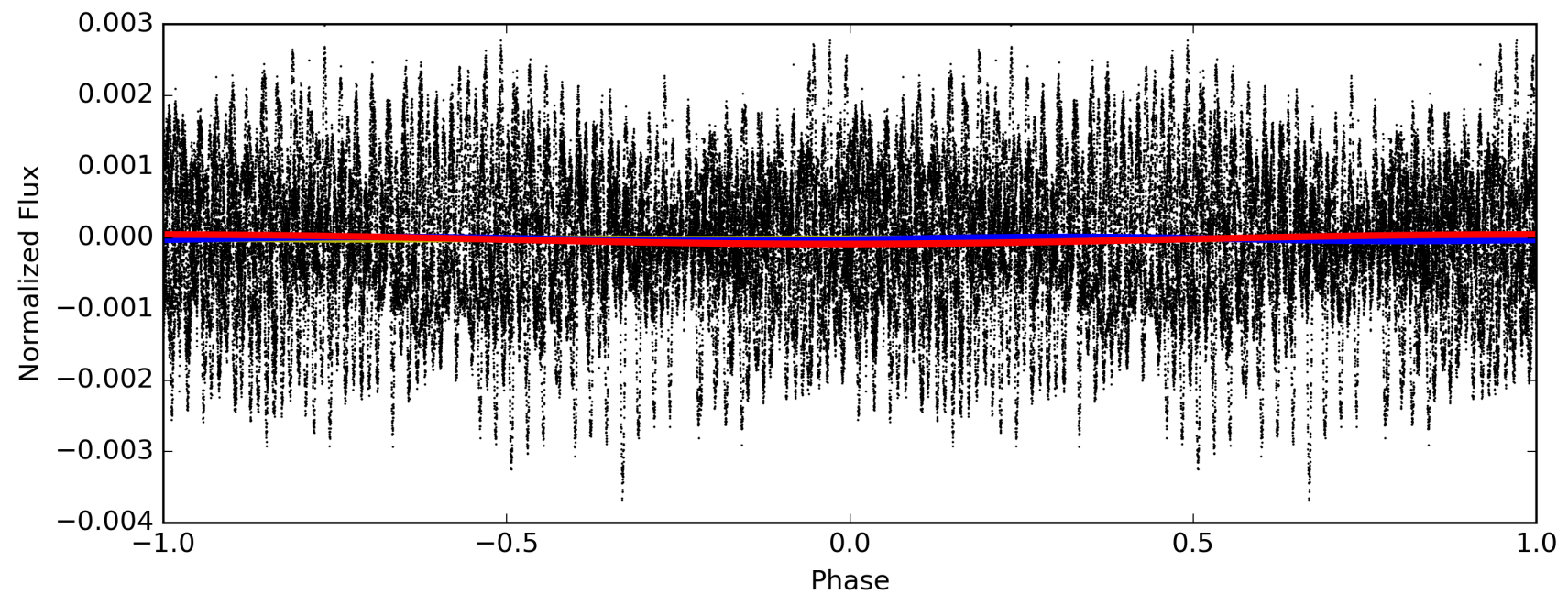
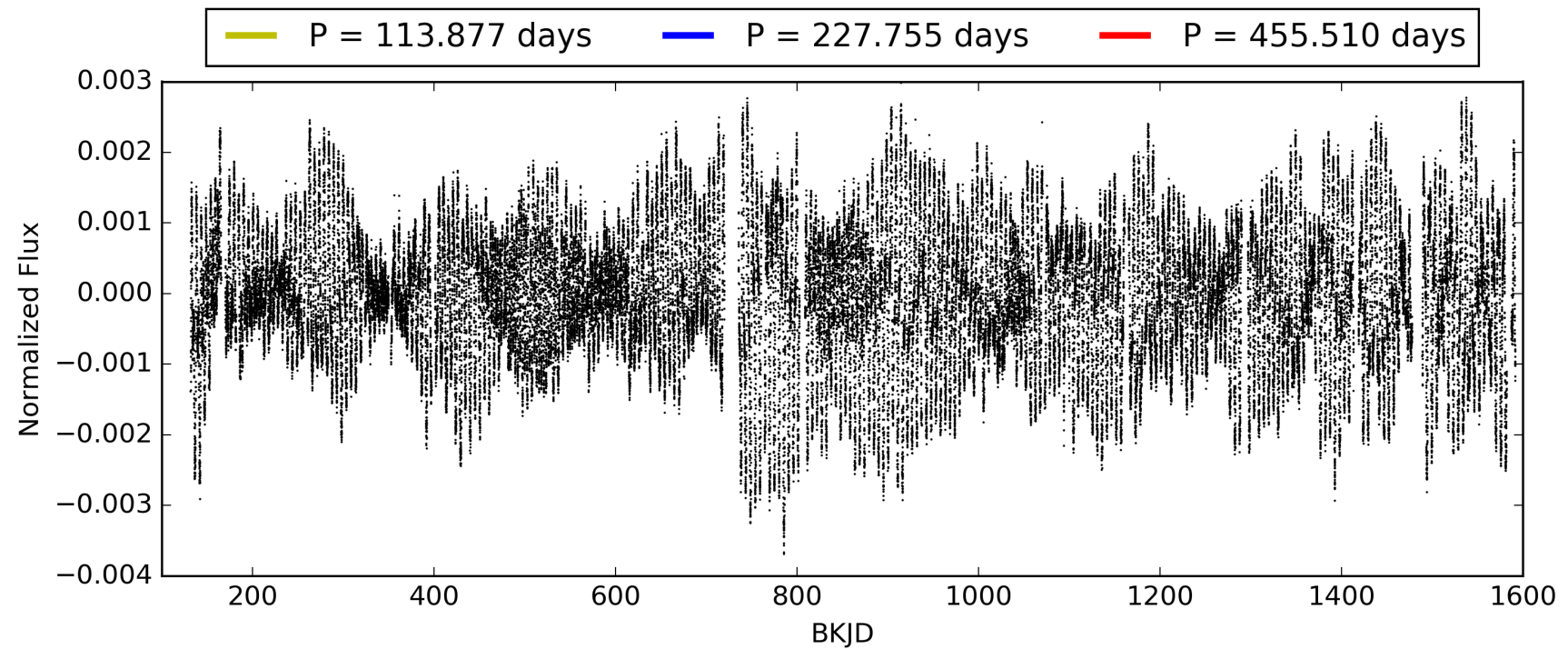
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:22:05 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-06, PDC Light Curves

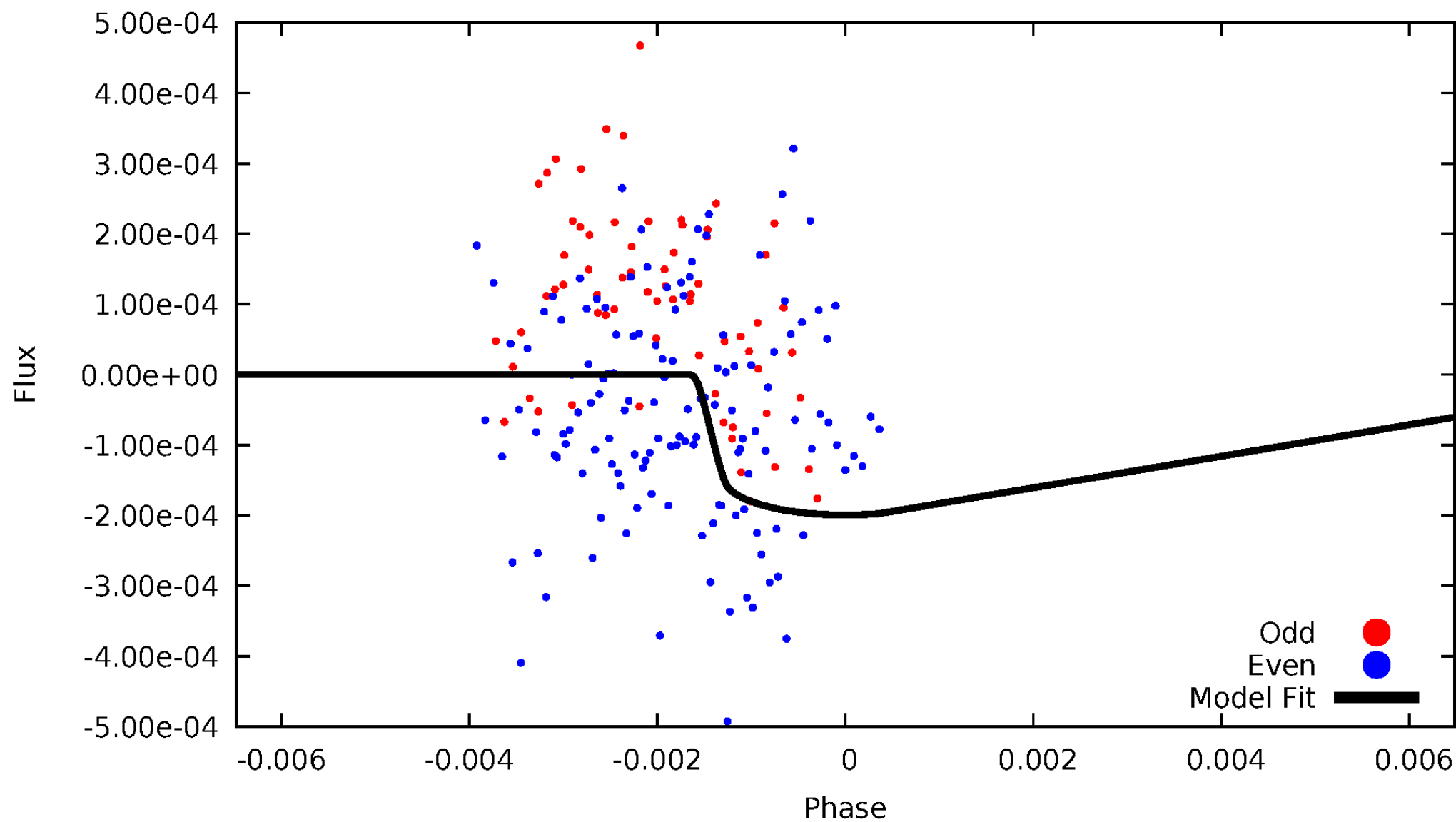


TCE 012457978-06



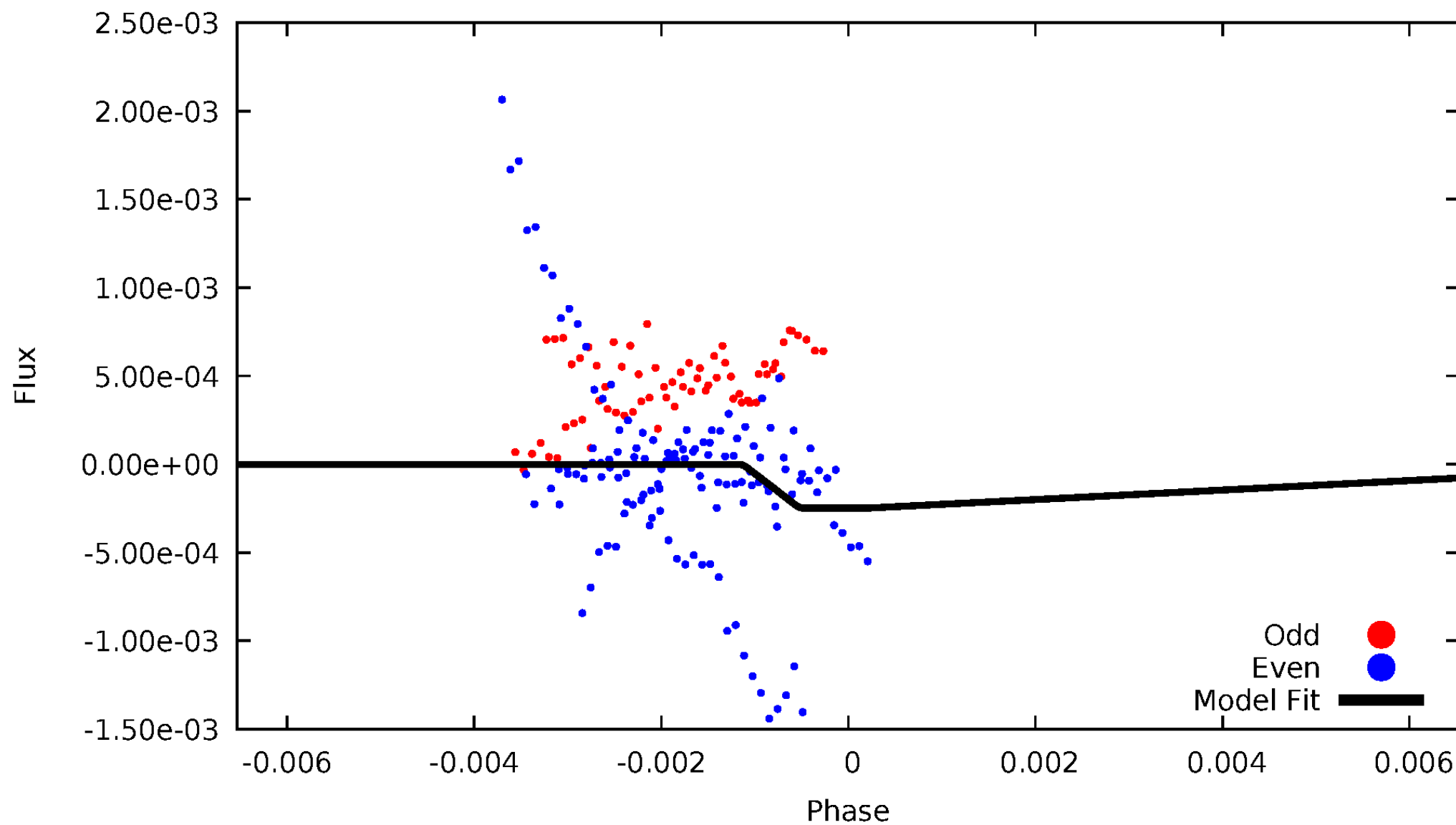
DV Odd/Even

TCE 012457978-06



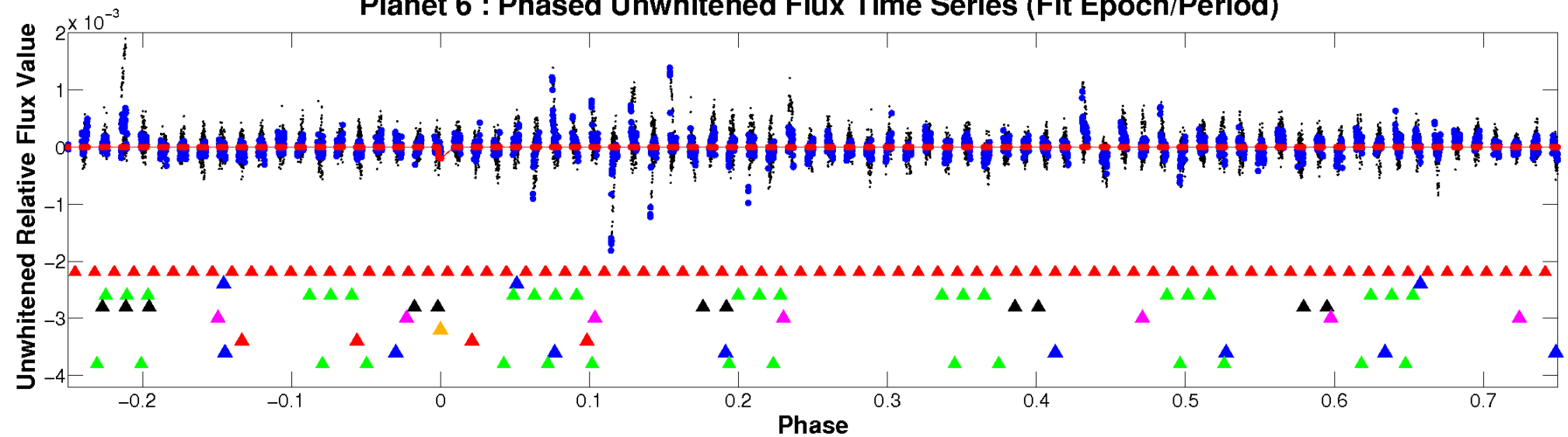
ALT Odd/Even

TCE 012457978-06

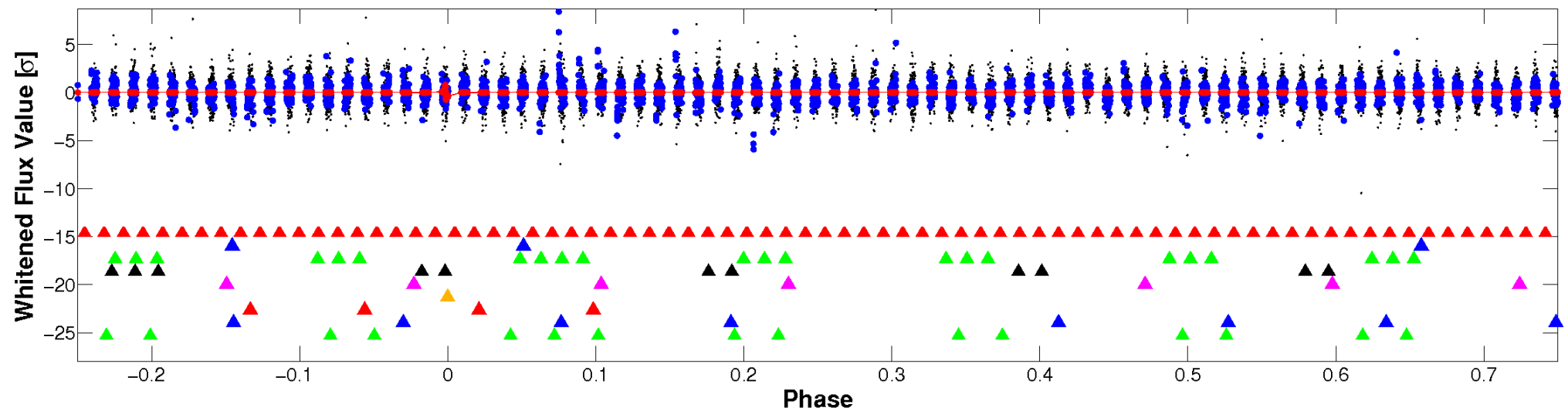


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

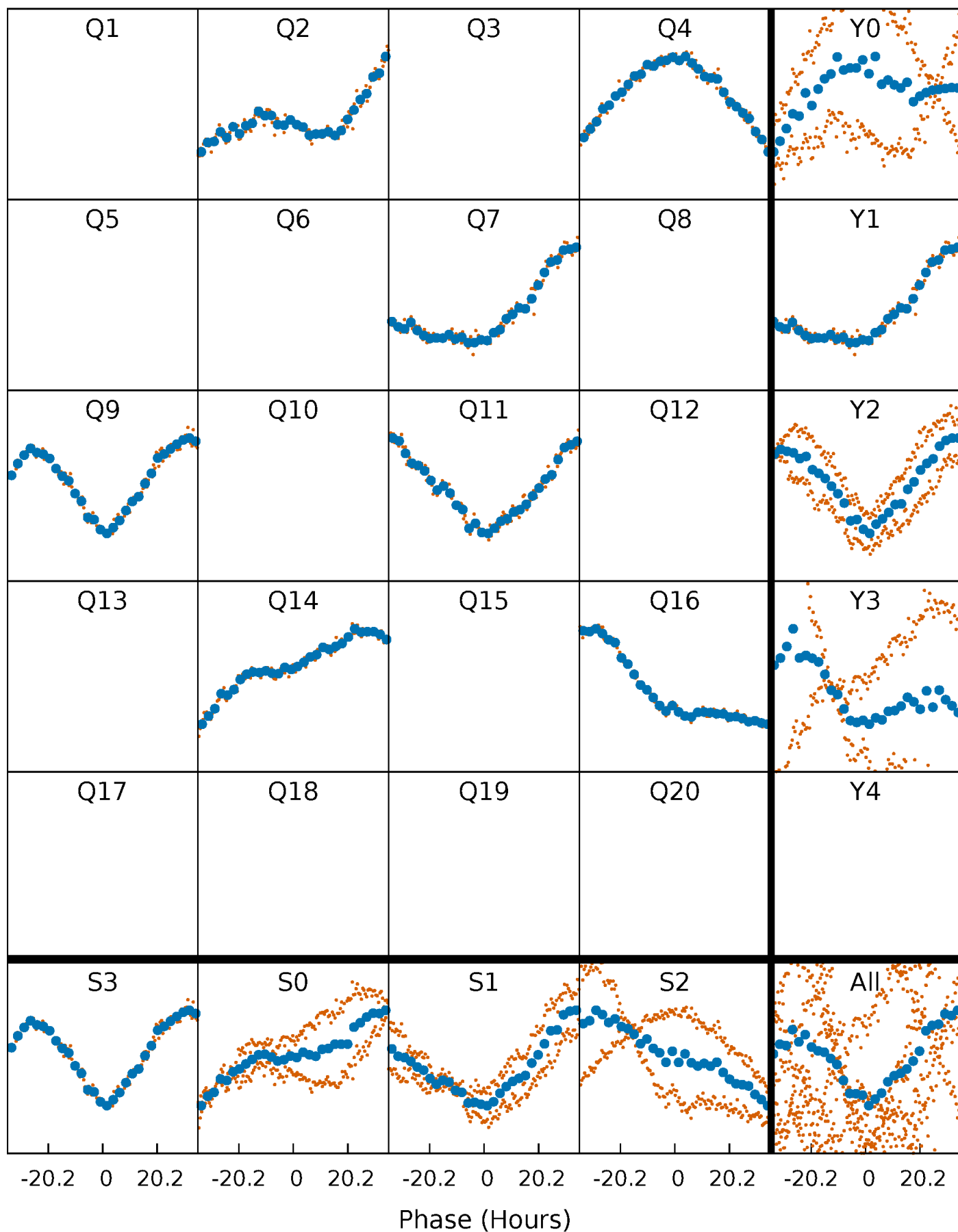


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



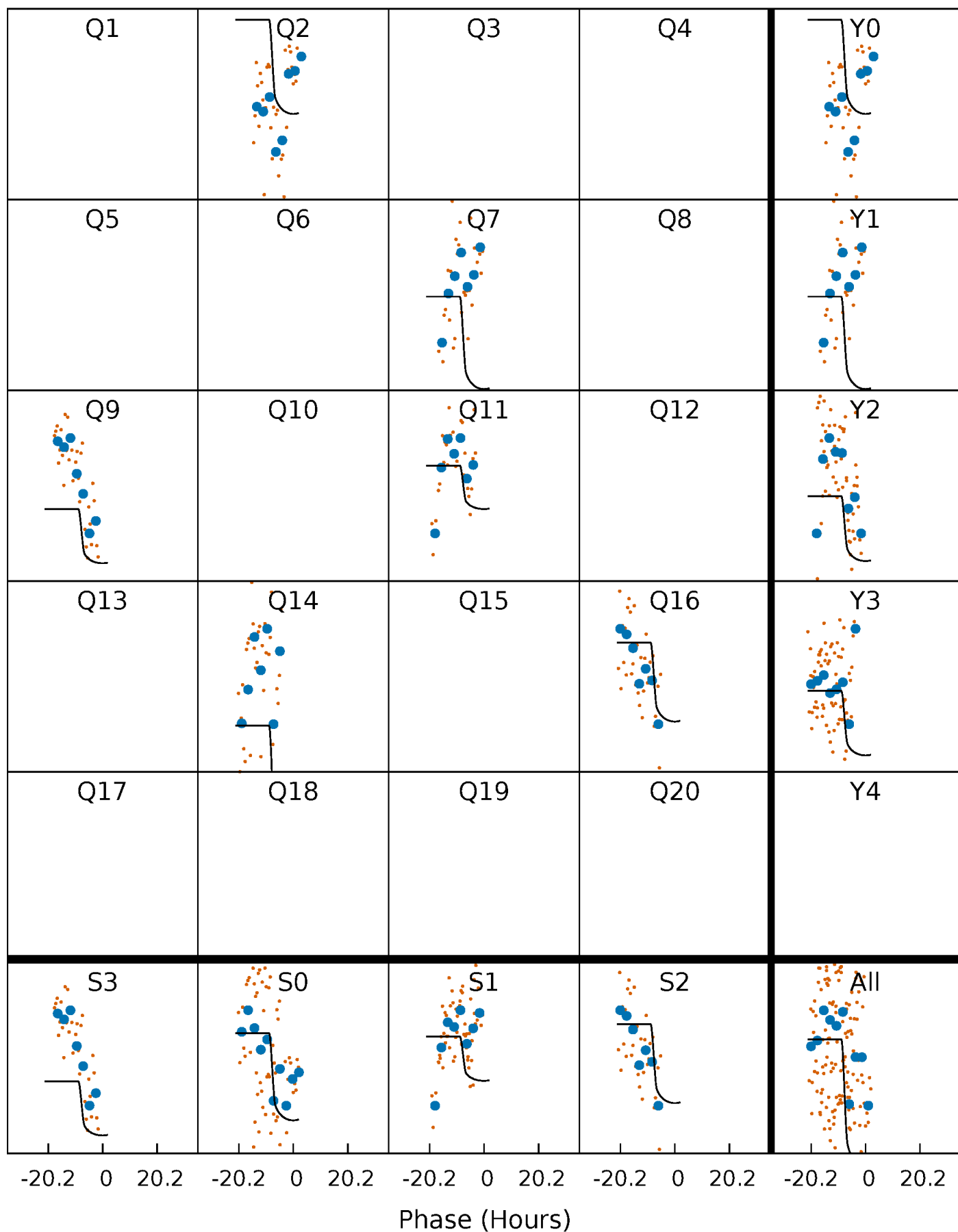
PDC Quarter-Phased Transit Curves

TCE 012457978-06 P=227.754759 Days $T_0=177.386345$ (BKJD)



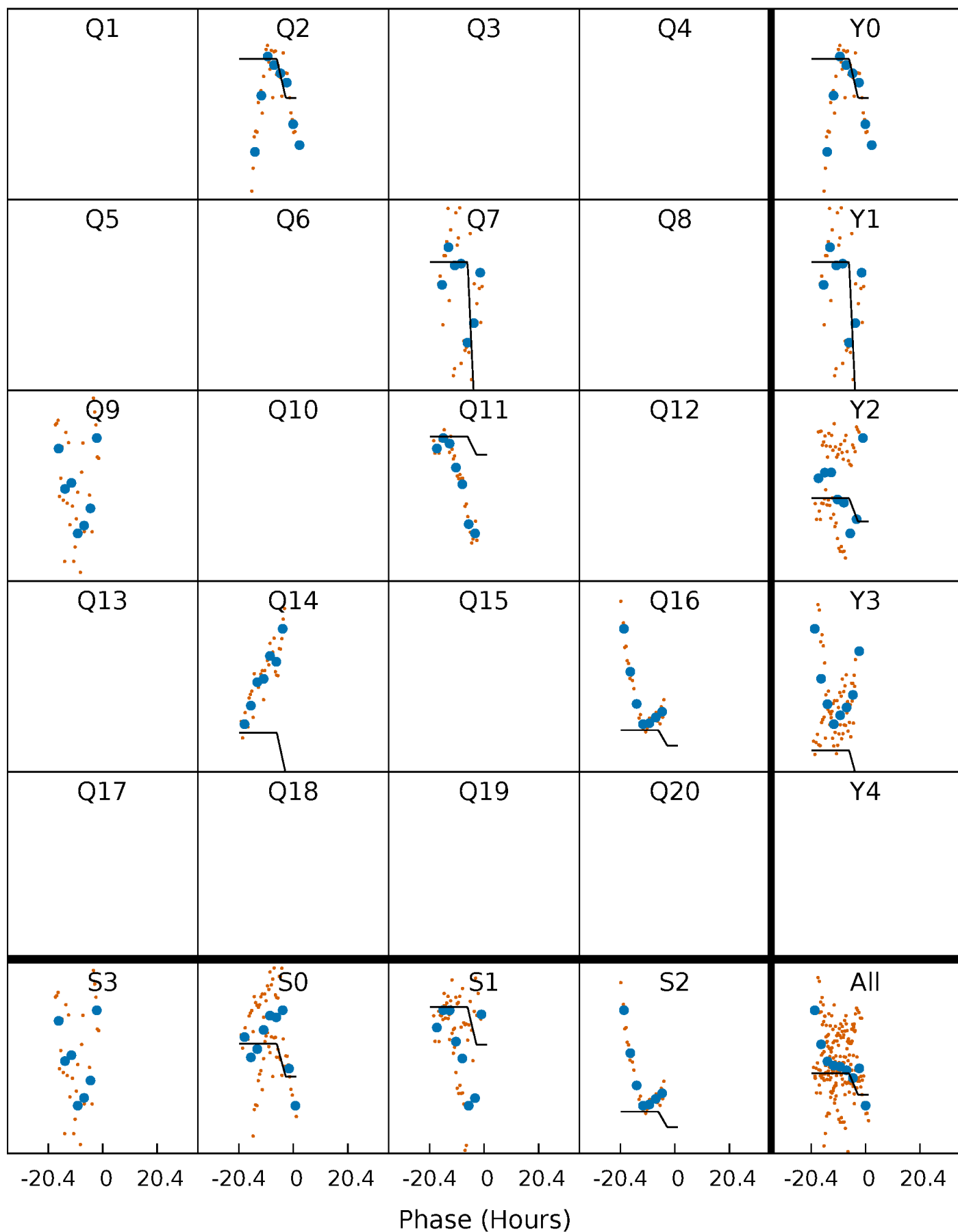
DV Quarter-Phased Transit Curves

TCE 012457978-06 P=227.754759 Days $T_0=177.386345$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

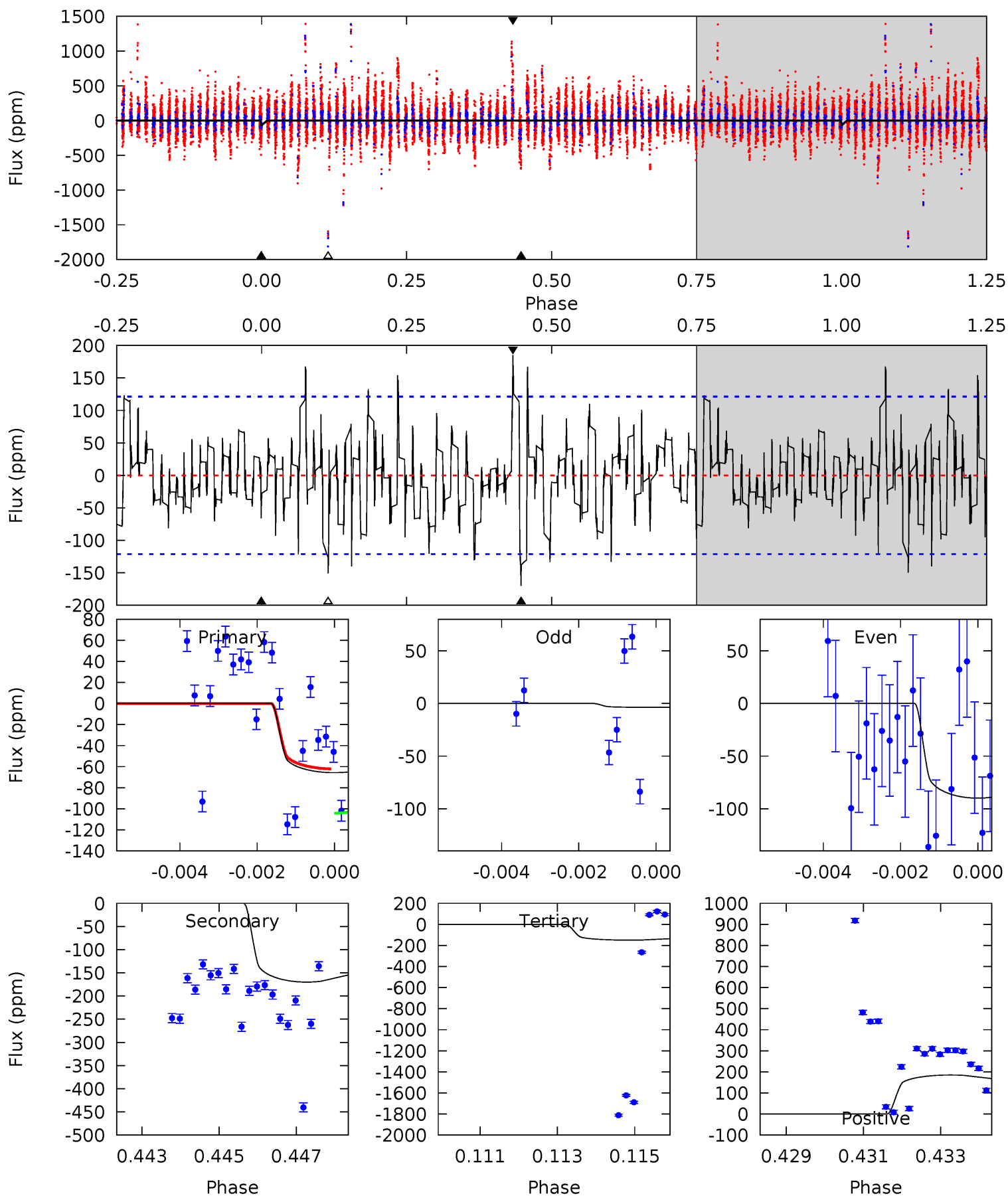
TCE 012457978-06 P=227.740714 Days $T_0=177.421276$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-06, P = 227.754759 Days, E = 177.386345 Days

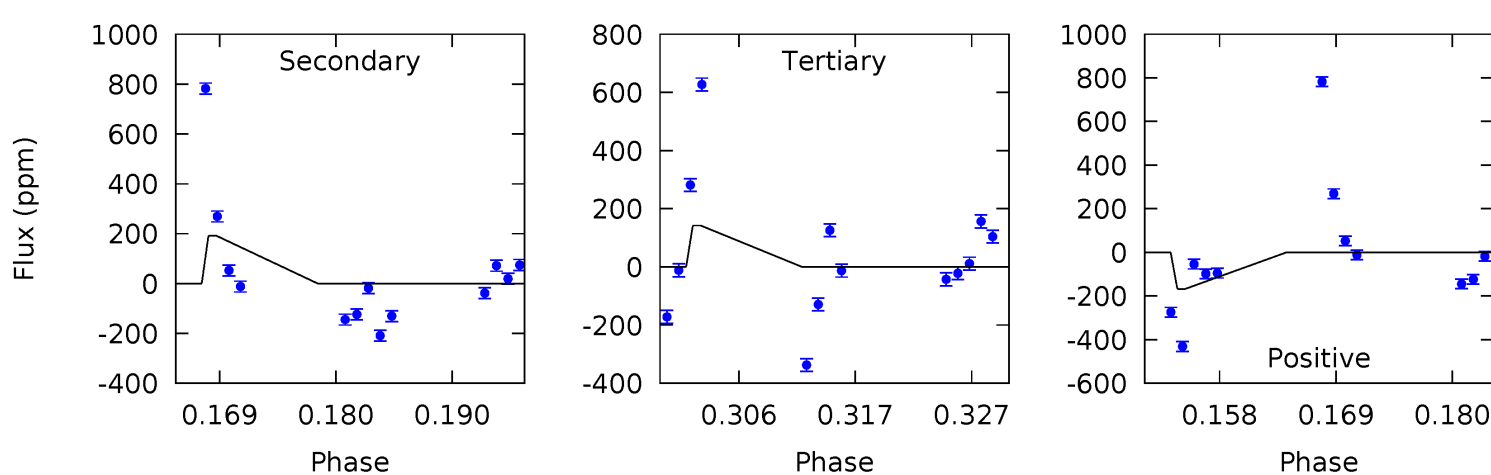
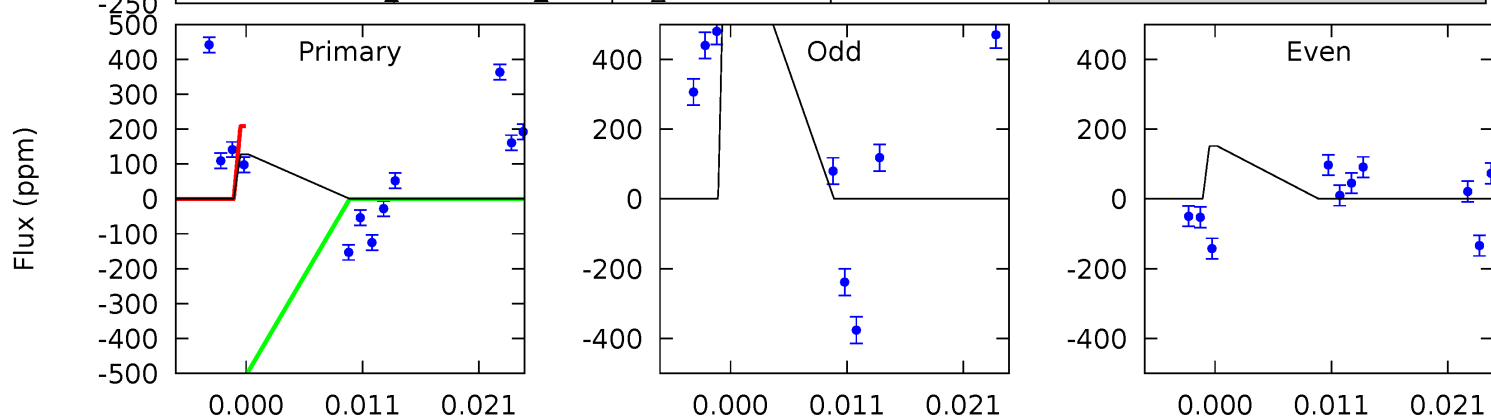
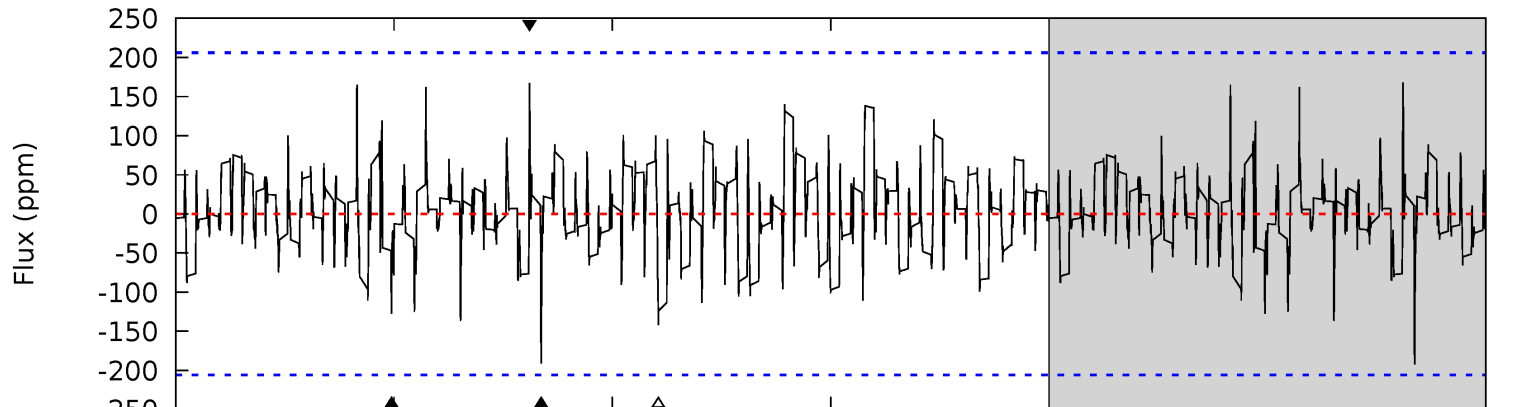
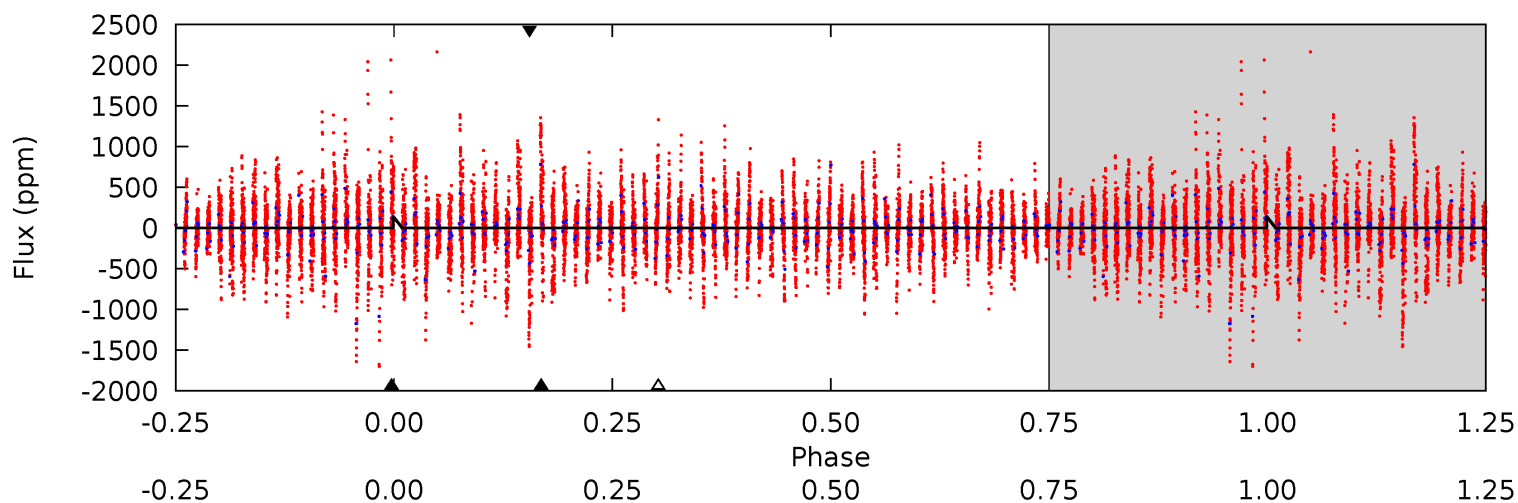
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.89	7.47	6.58	8.13	5.33	3.09	2.18	-3.69	-5.24	0.89	-0.66	1.62	1.90	0.52	0.35



Alt Model-Shift Uniqueness Test

012457978-06, P = 227.740714 Days, E = 177.421276 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.11	4.67	3.46	4.08	5.02	2.56	1.07	-0.36	-0.97	1.20	0.59	6.99	0.18	0.47	1.66



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-170 ± 23	$4.28^{+0.82}_{-0.90}$	740^{+45}_{-62}	6380^{+540}_{-493}	3925^{+2096}_{-1310}
Alt.	-191 ± 41	$4.37^{+0.75}_{-0.99}$	742^{+43}_{-62}	6494^{+670}_{-549}	4220^{+2529}_{-1504}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

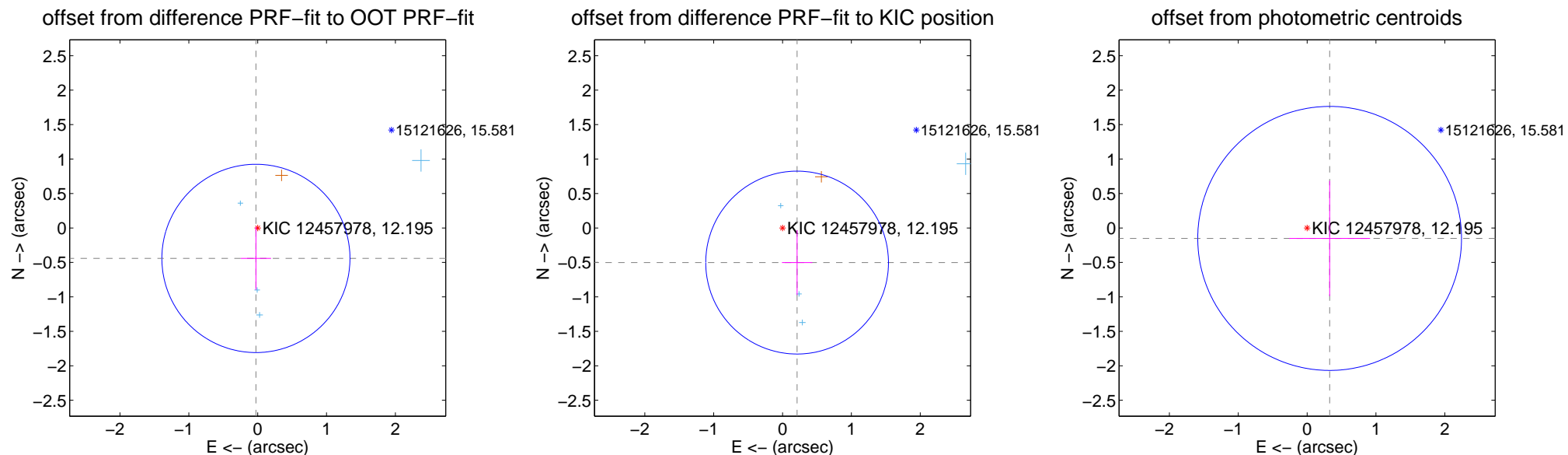
DV Centroid Data

Supplemental centroid analysis for 012457978-06. Kepler magnitude: 12.20. Transit SNR 6.53

There are 4 quarters with good PRF difference image offsets

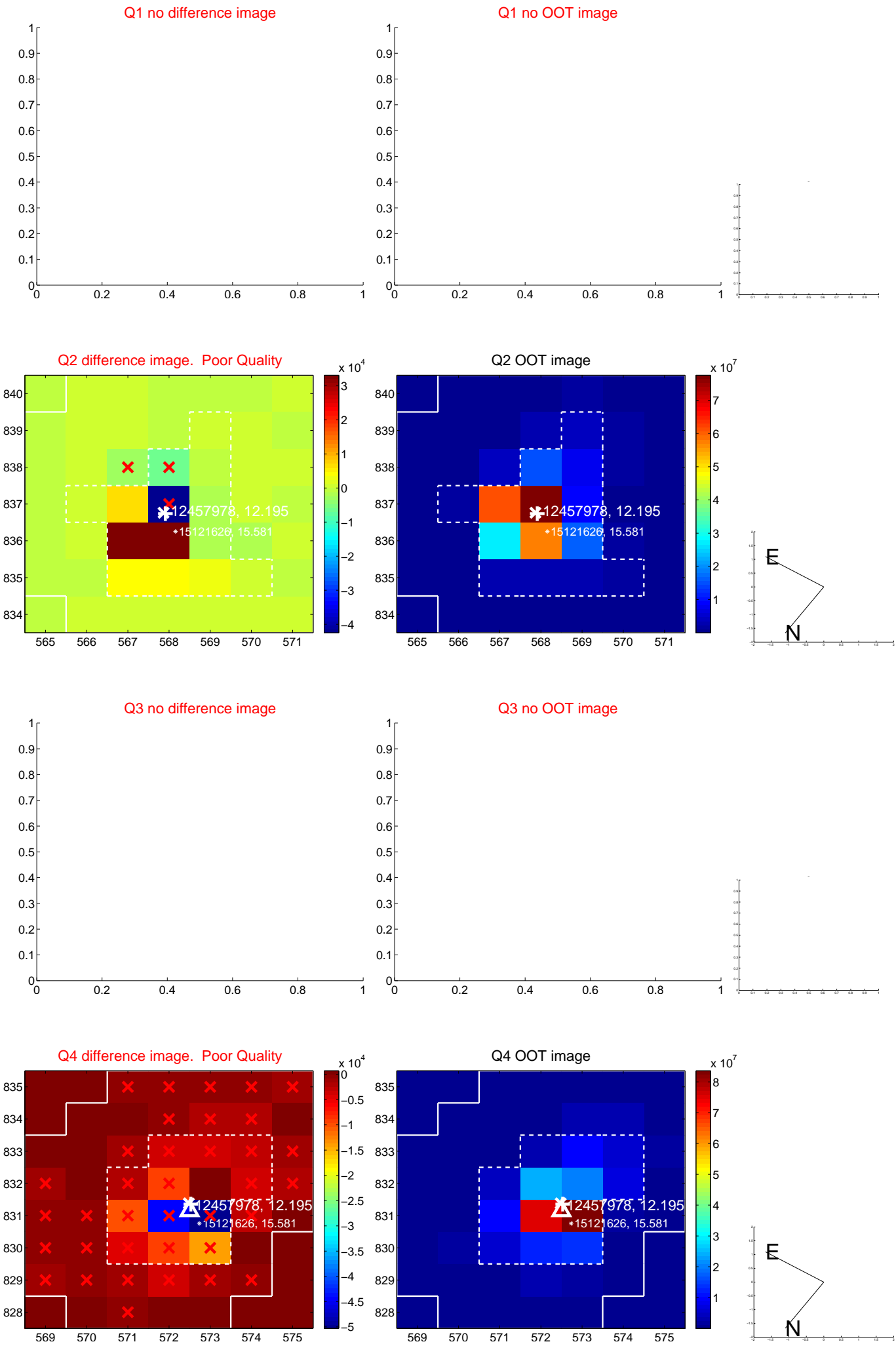
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.443 ± 0.455	0.97	0.026 ± 0.220	-0.442 ± 0.456
PRF-fit source offset from KIC position	0.545 ± 0.442	1.23	-0.212 ± 0.220	-0.502 ± 0.471
photometric centroid source offset	0.36 ± 0.64	0.56	-0.33 ± 0.59	-0.15 ± 0.84



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

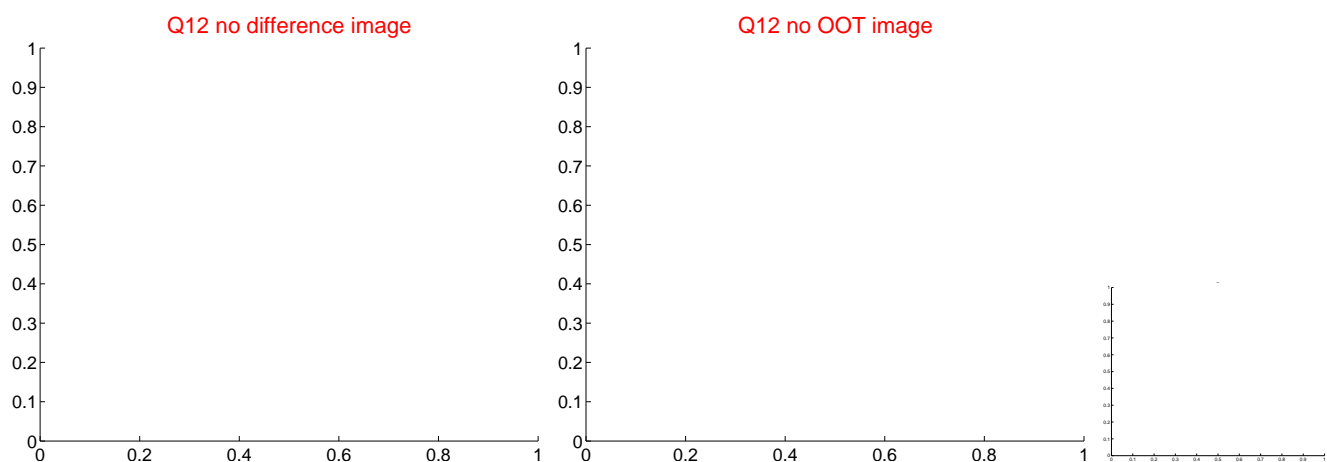
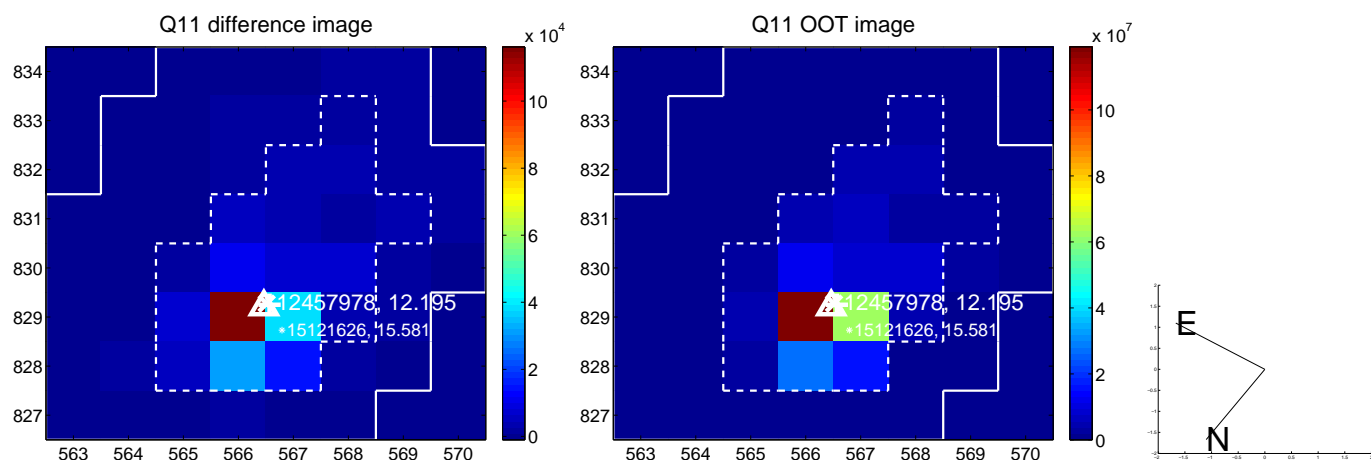
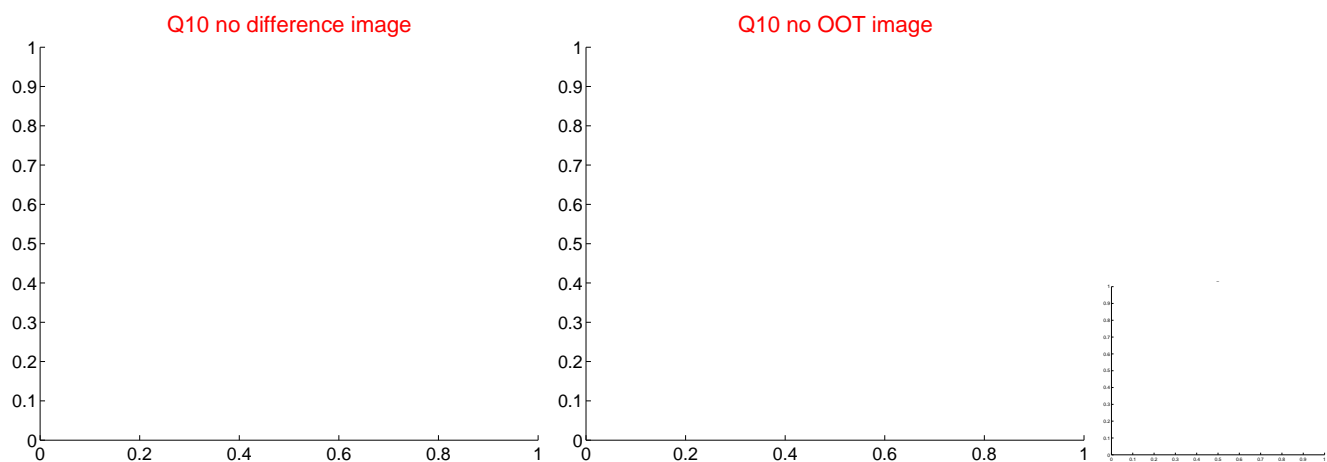
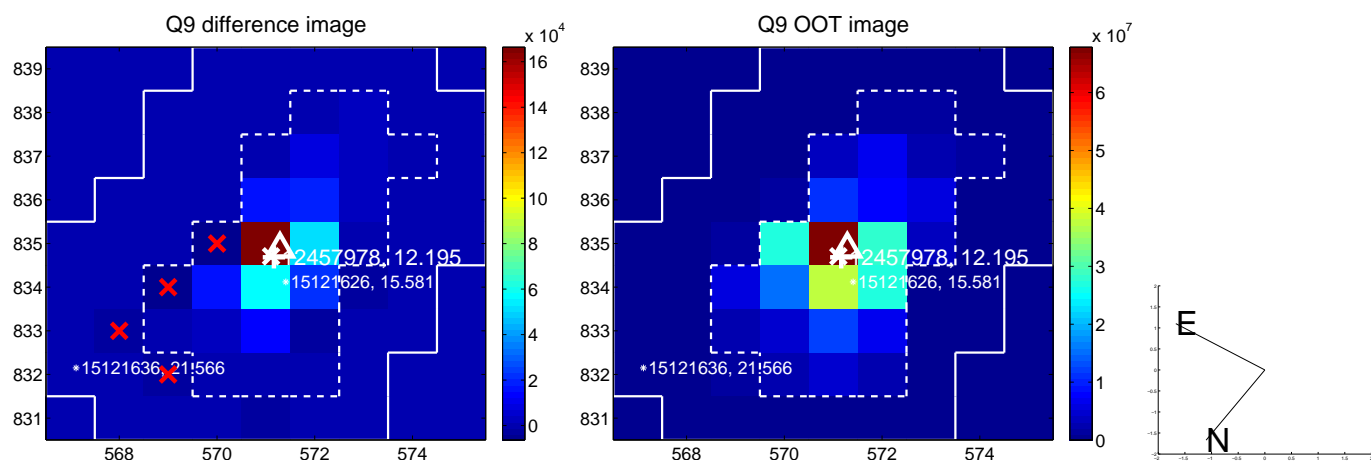
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



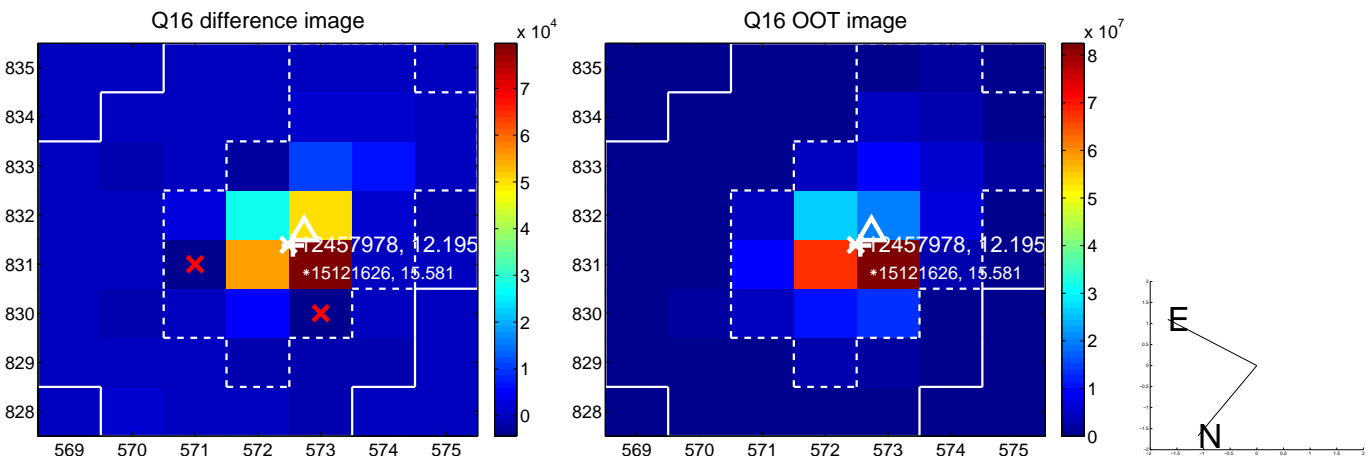
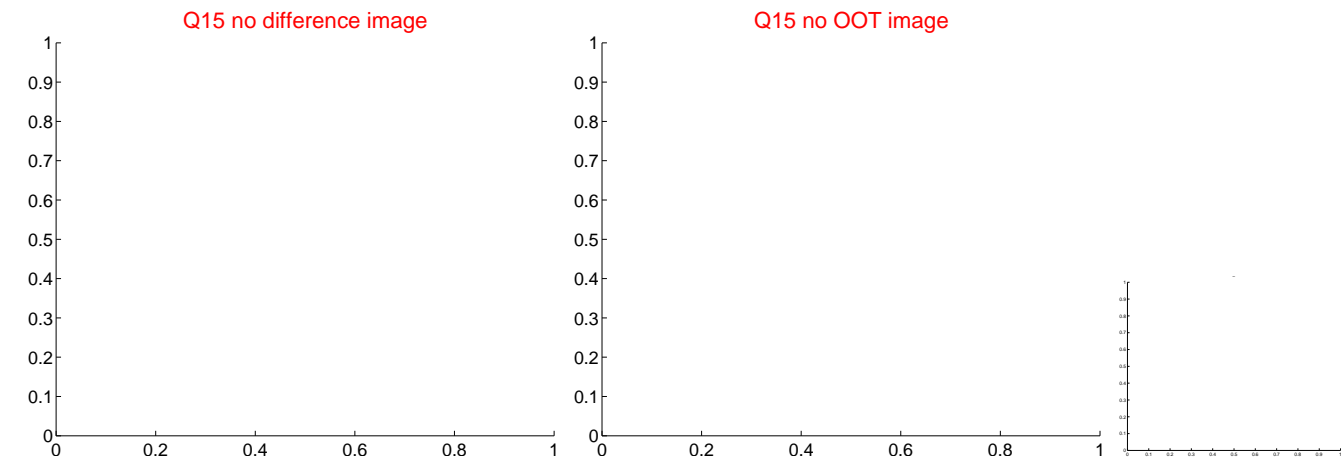
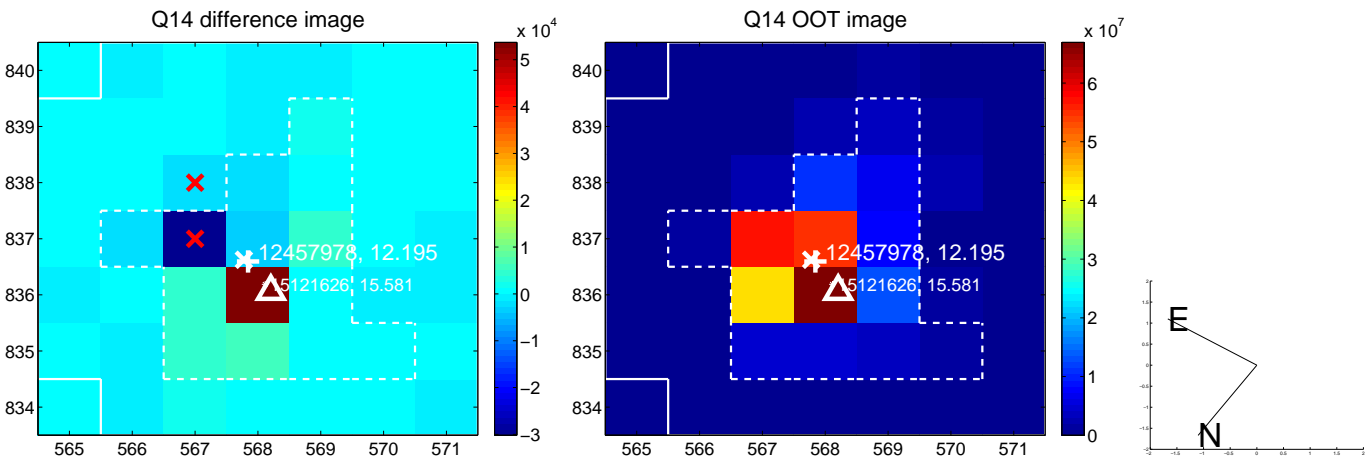
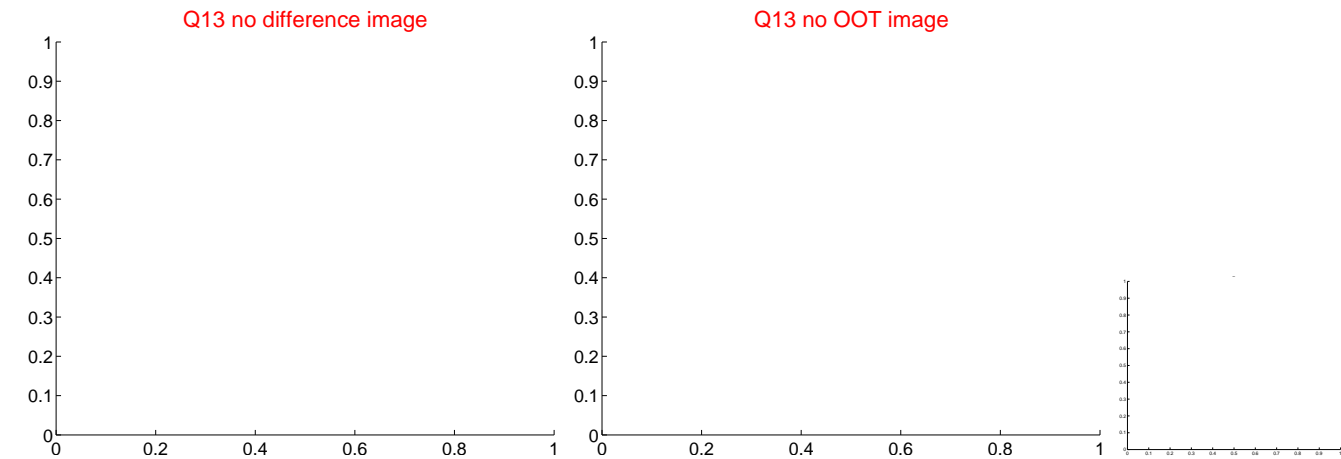
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



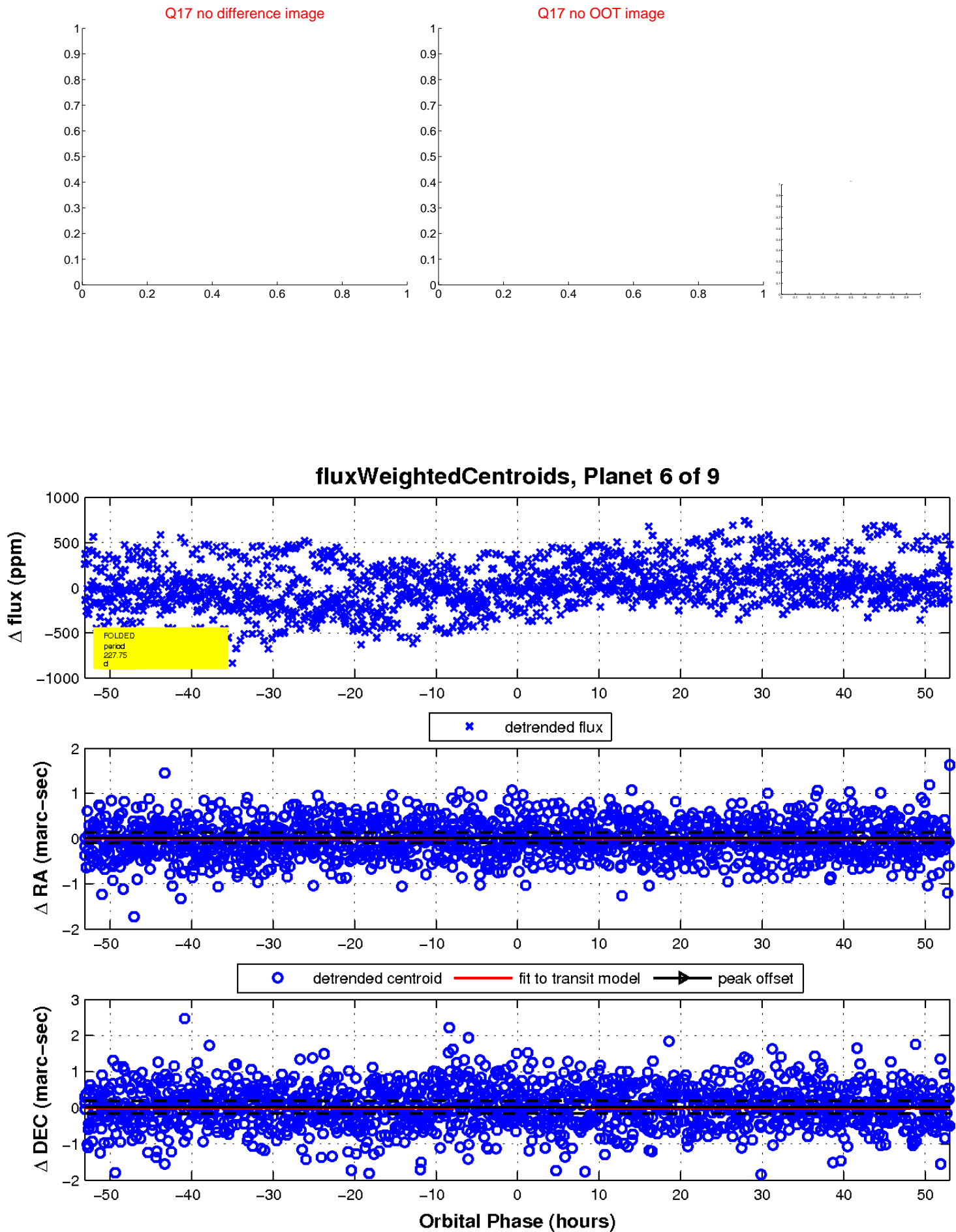
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

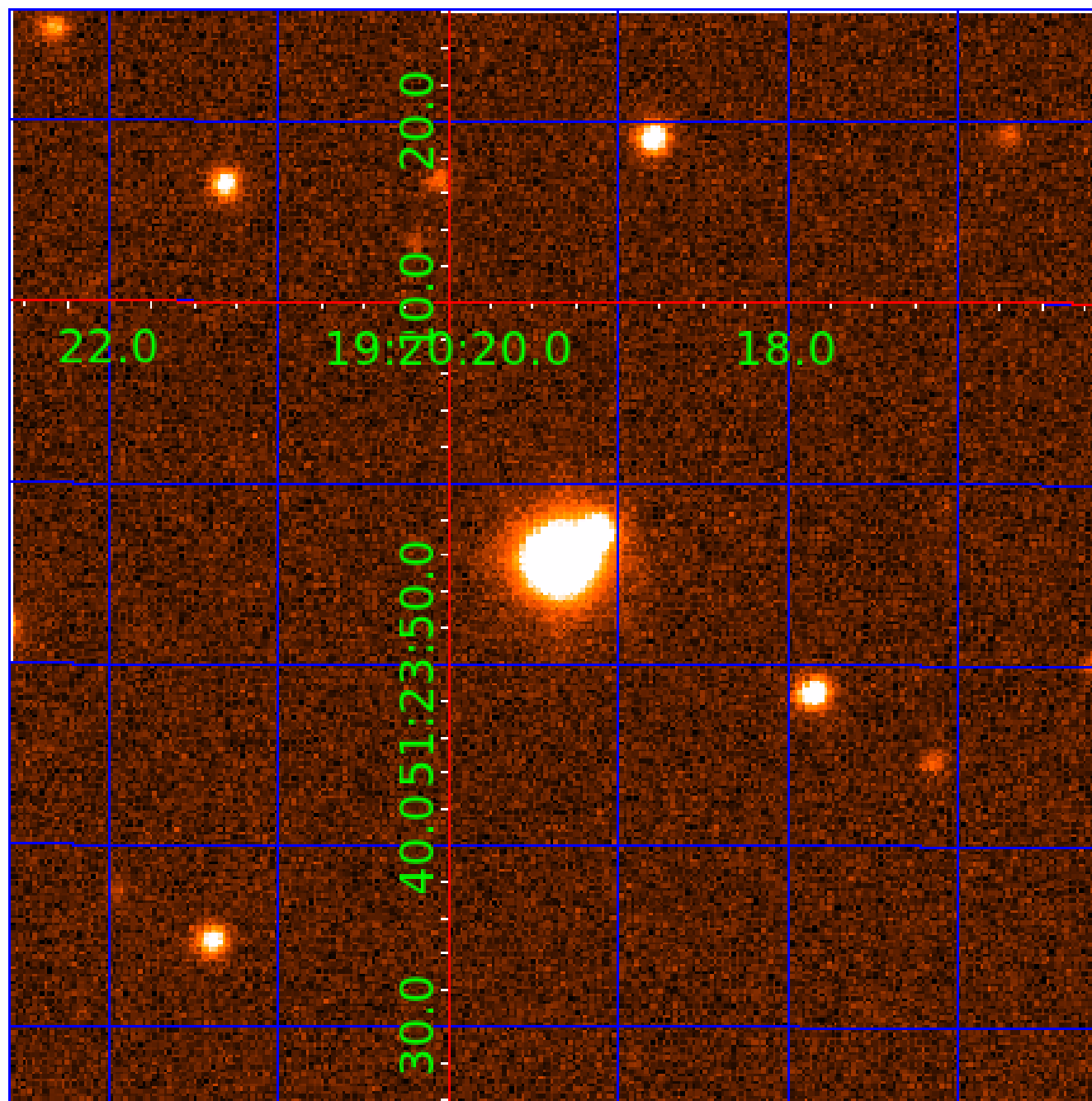


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

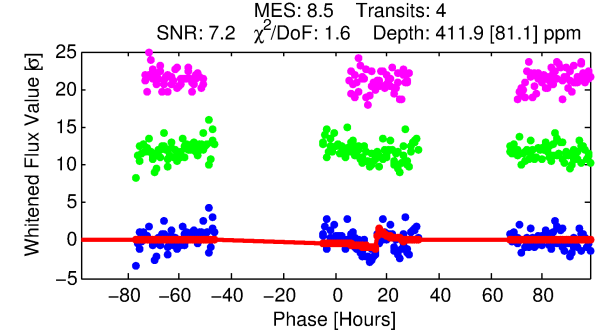
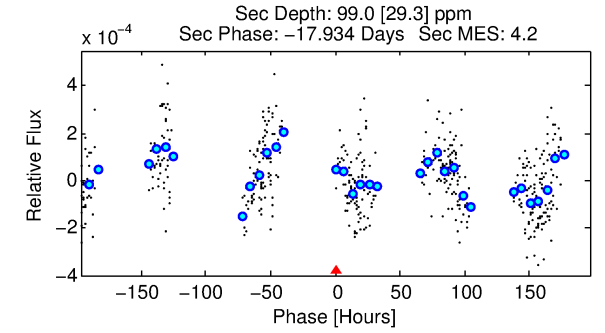
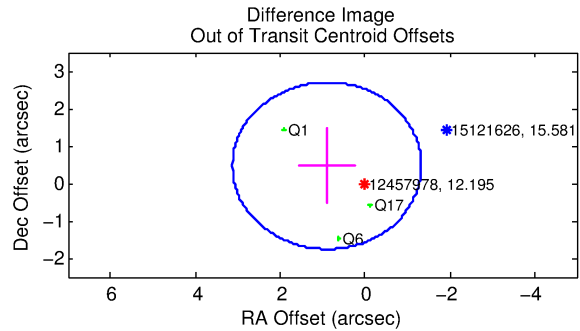
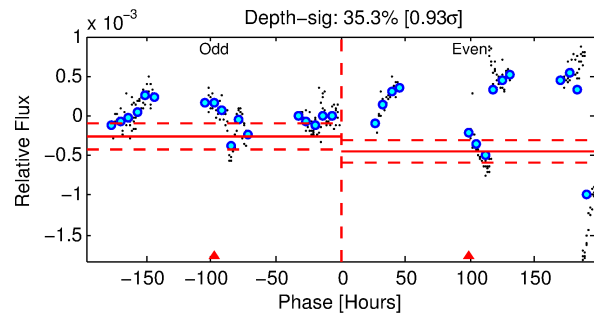
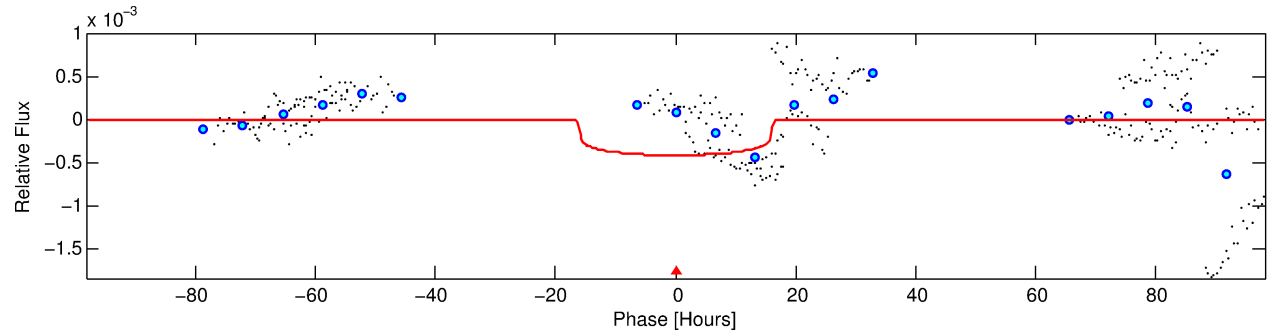
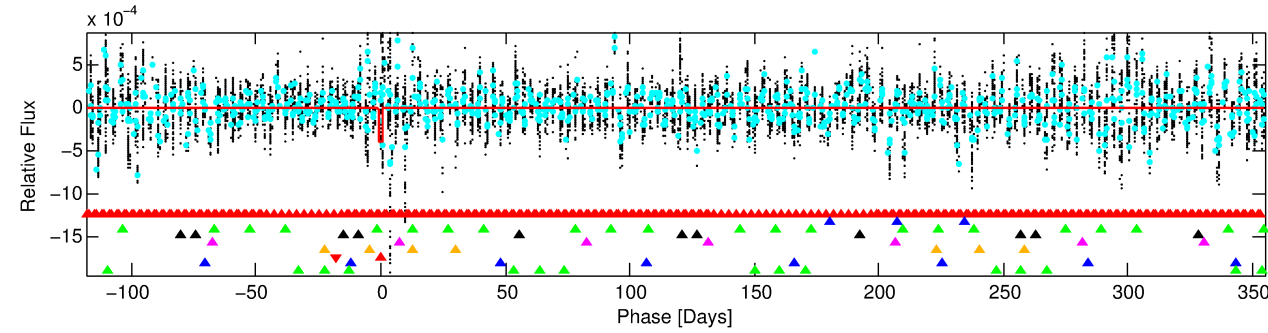
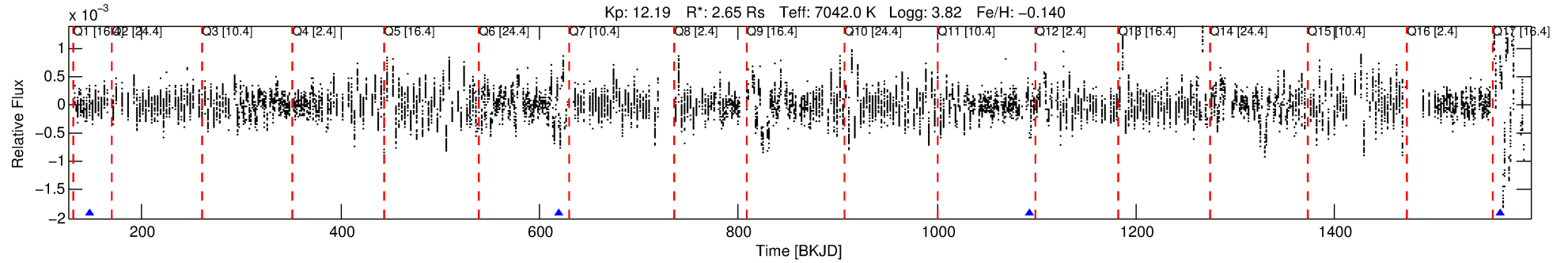
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-07

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 7 of 9 Period: 473.097 d



DV Fit Results:

Period = 473.09750 [0.00902] d
Epoch = 147.0282 [0.1039] BKJD
Rp/R* = 0.0187 [0.0139]
a/R* = 112.62 [477.49]
b = 0.01 [760.57]
Seff = 7.69 [4.00]
Teq = 425 [55] K
Rp = 5.42 [4.49] Re
a = 1.4192 [0.4654] AU
Ag = 3730.06 [5942.27] [0.63 σ]
Teffp = 5131 [1948] K [2.41 σ]

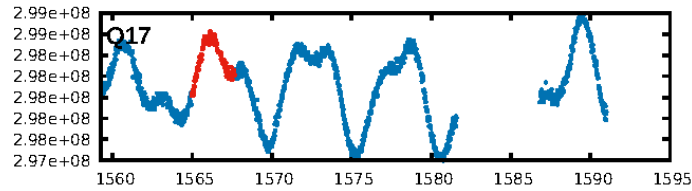
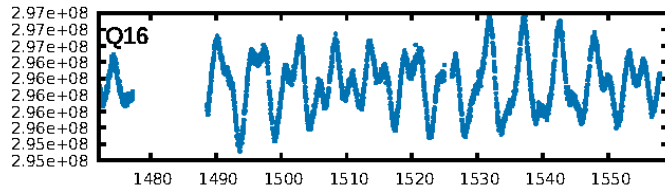
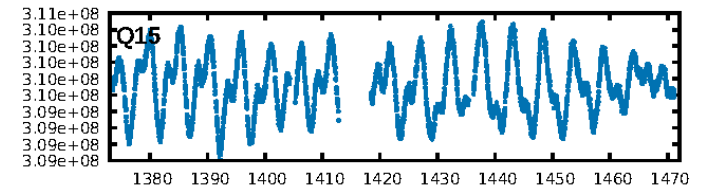
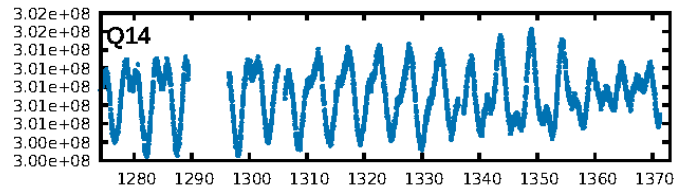
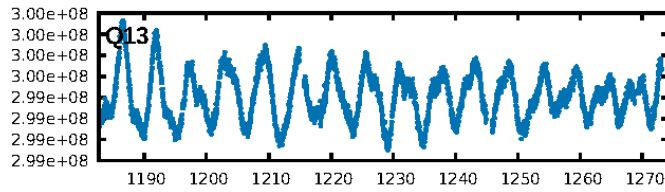
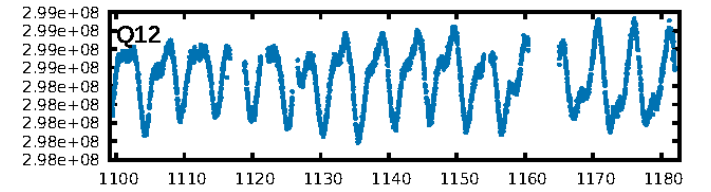
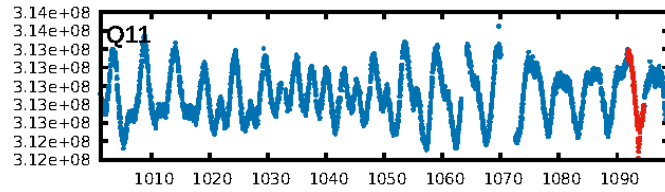
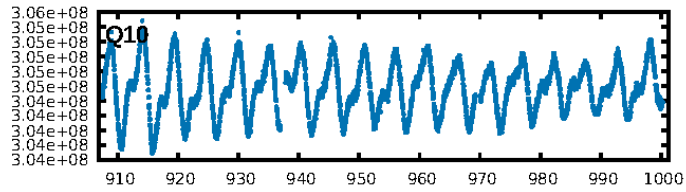
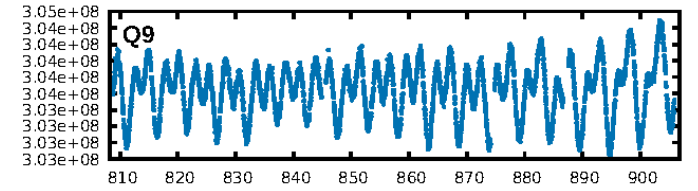
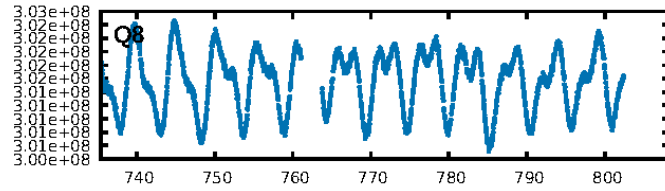
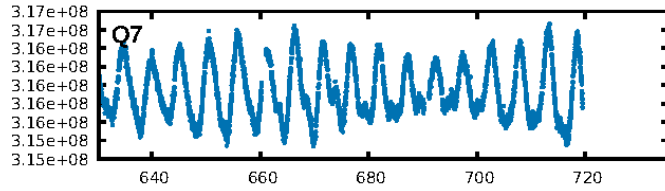
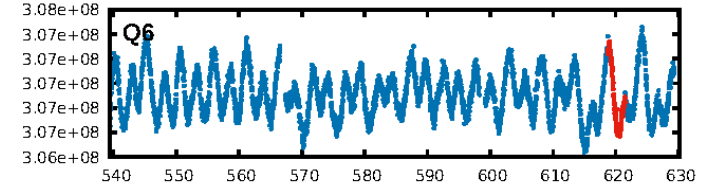
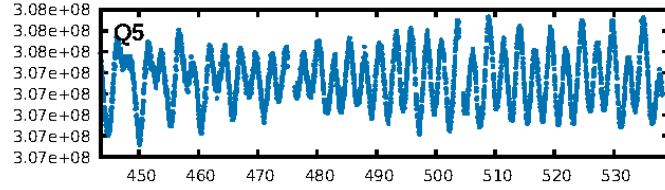
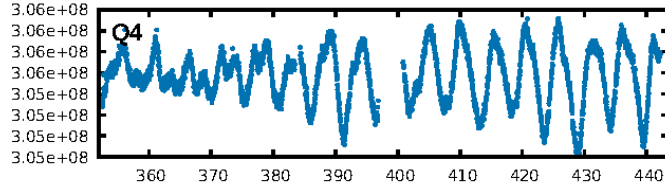
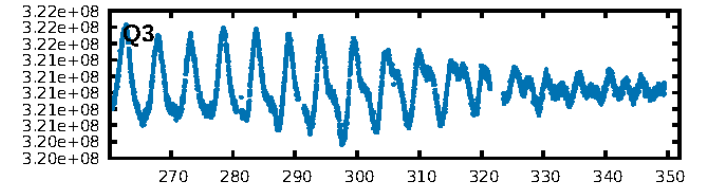
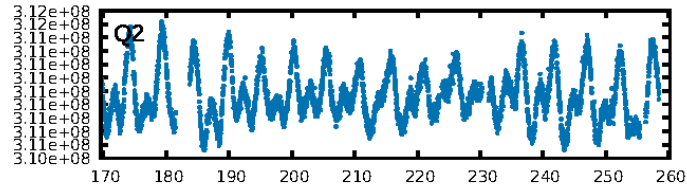
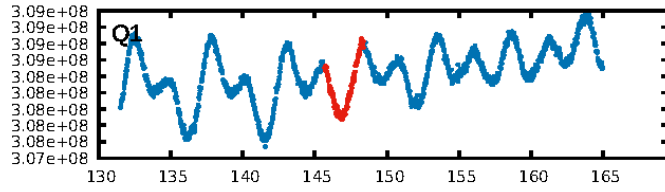
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [158.38 σ]
LongPeriod-sig: 100.0% [19.62 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.37e-07
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.3665
Centroid-sig: 35.6%
Centroid-so: 0.458 arcsec [1.58 σ]
OotOffset-rm: 1.011 arcsec [1.36 σ]
KicOffset-rm: 0.767 arcsec [0.78 σ]
OotOffset-st: 1/0/0/2 [3]
KicOffset-st: 1/0/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

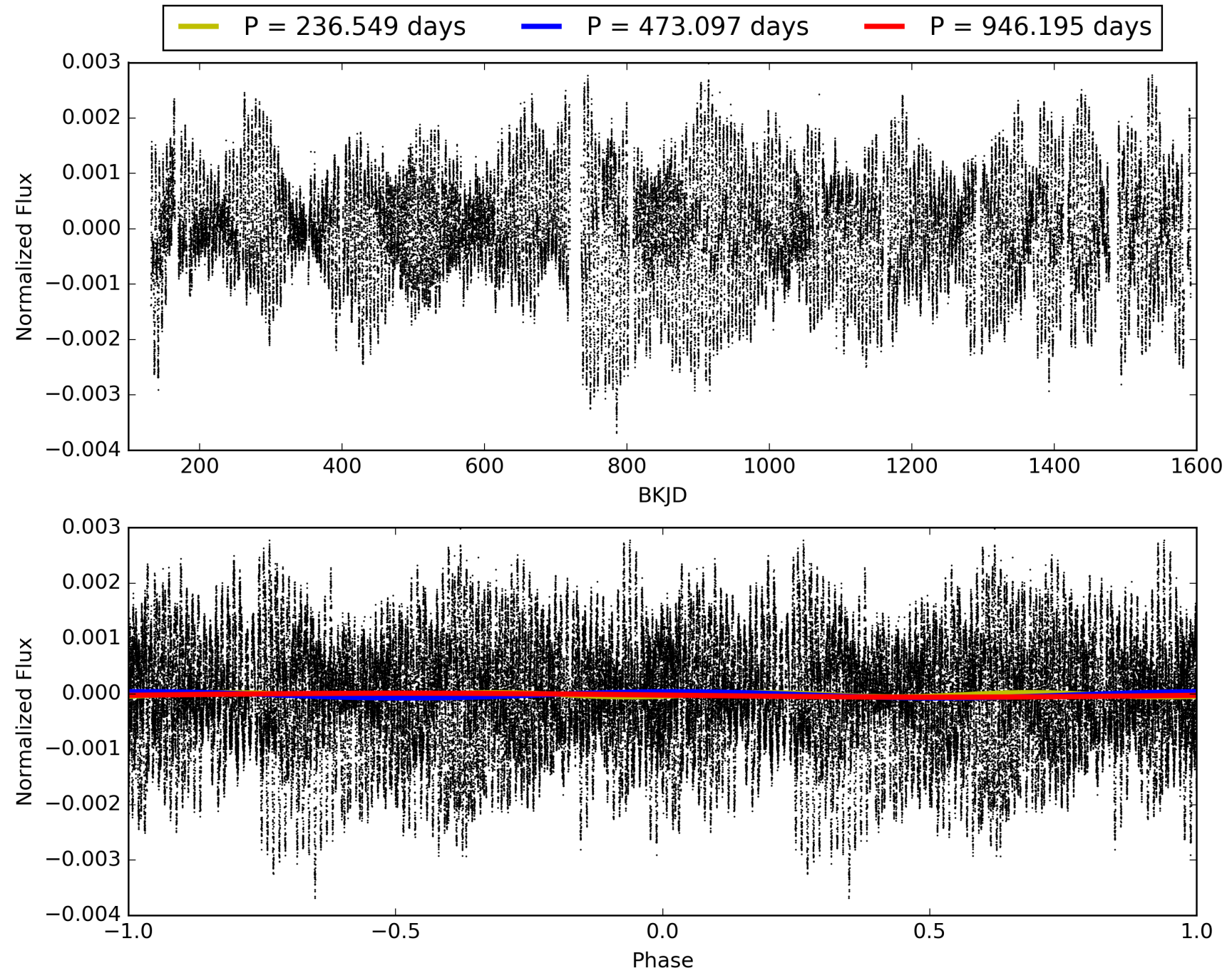
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:22:09 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-07, PDC Light Curves

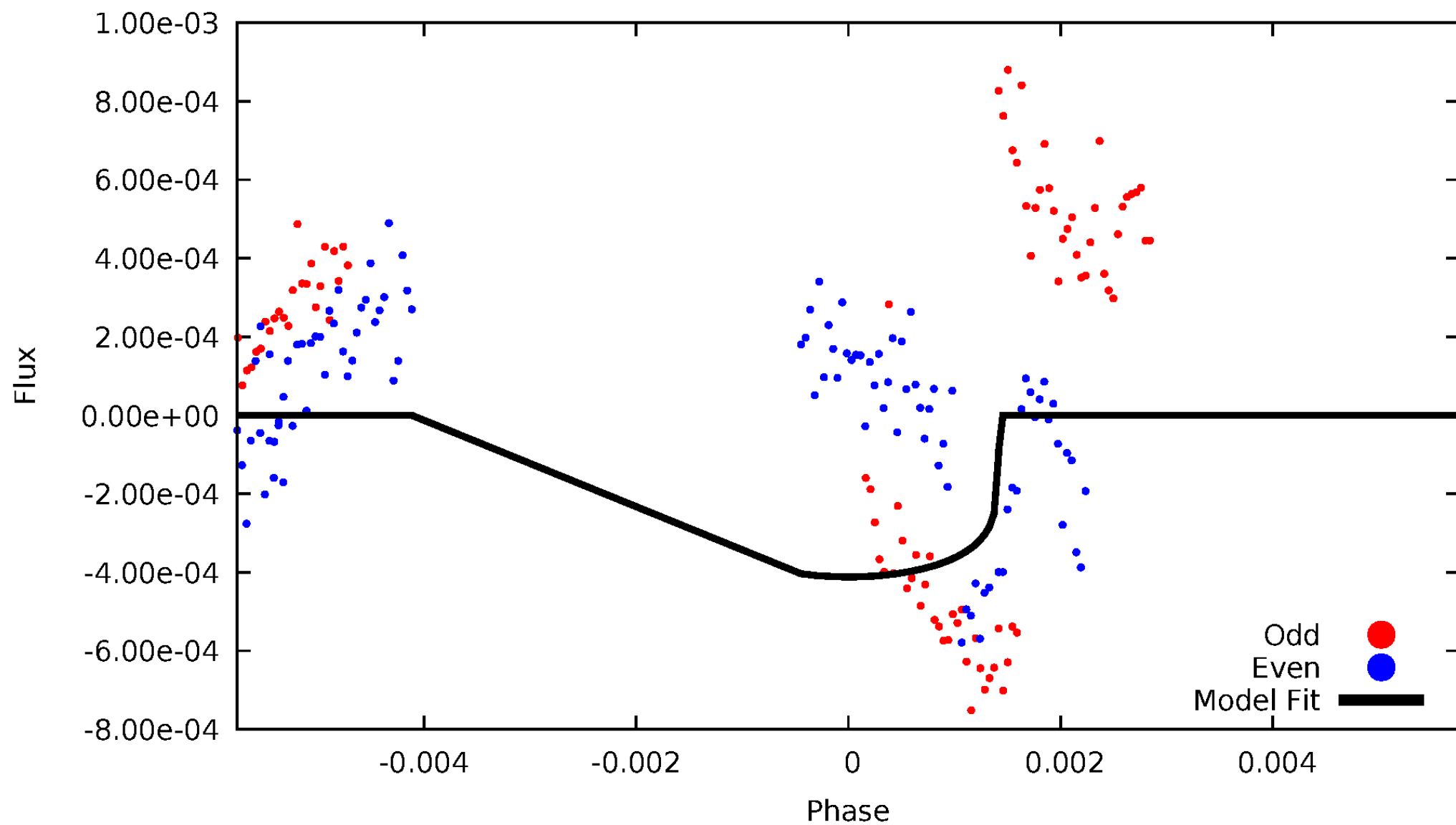


TCE 012457978-07



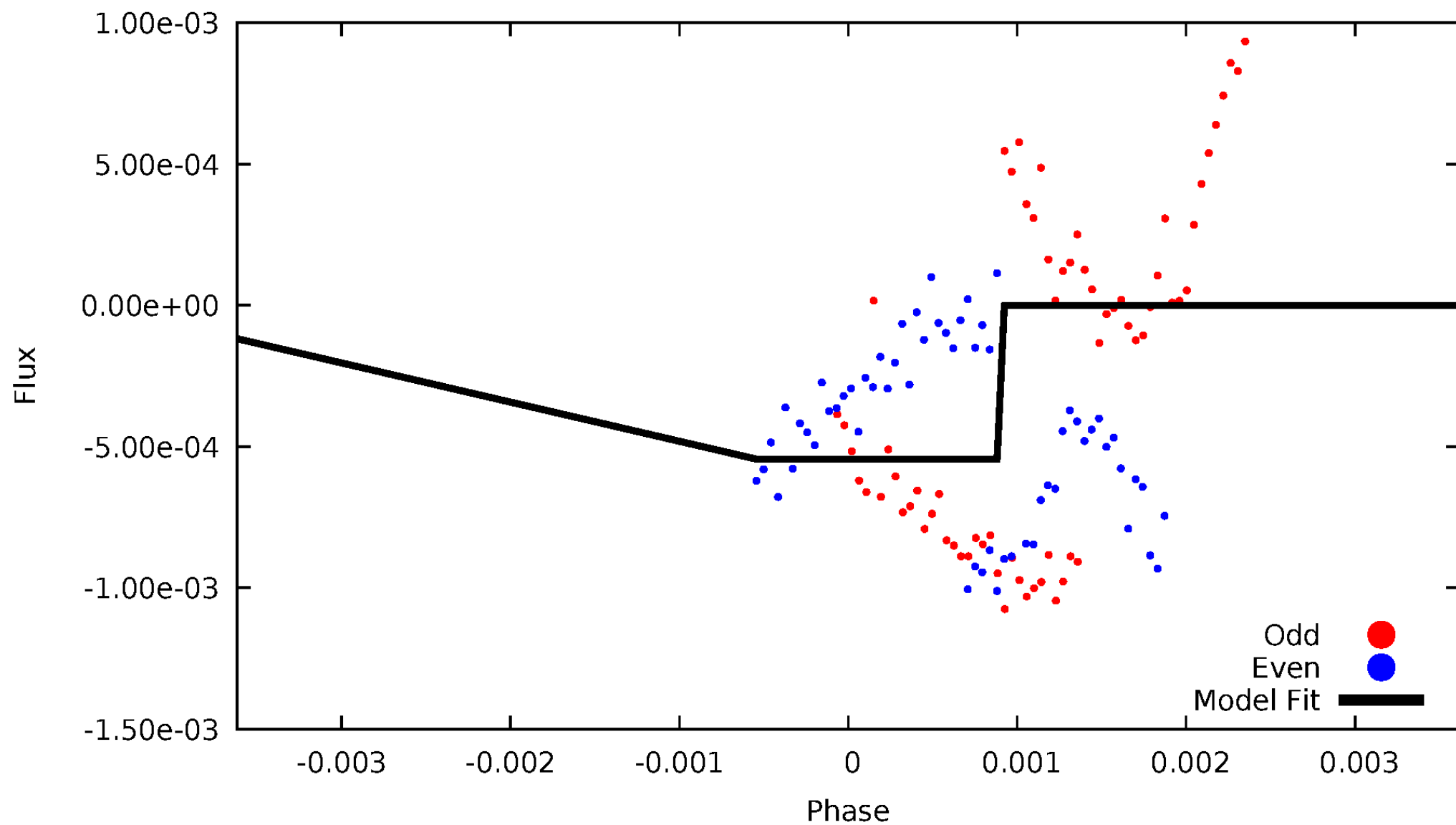
DV Odd/Even

TCE 012457978-07



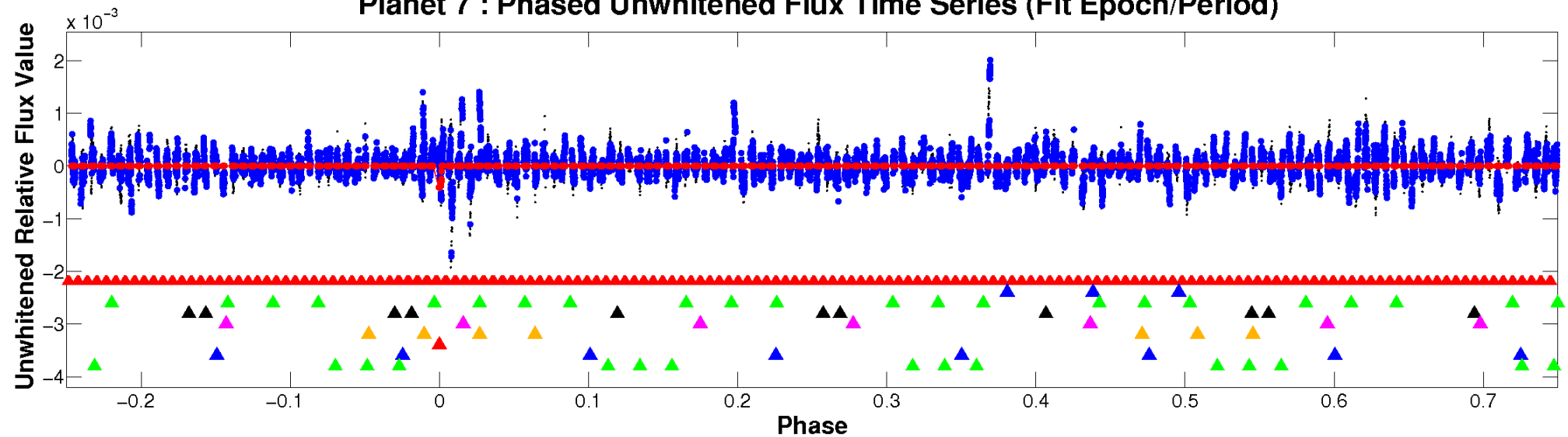
ALT Odd/Even

TCE 012457978-07

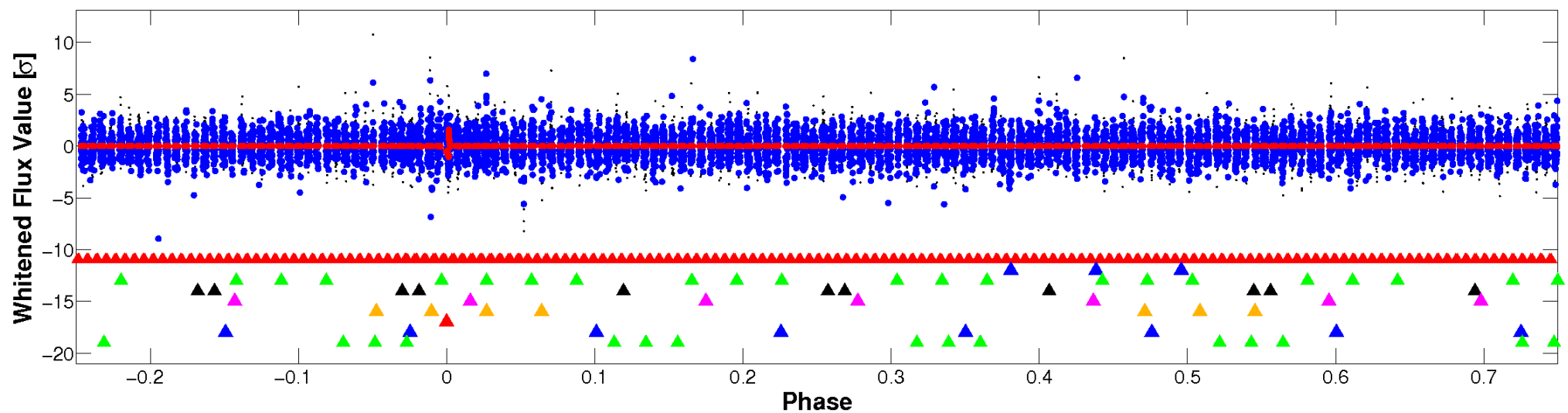


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

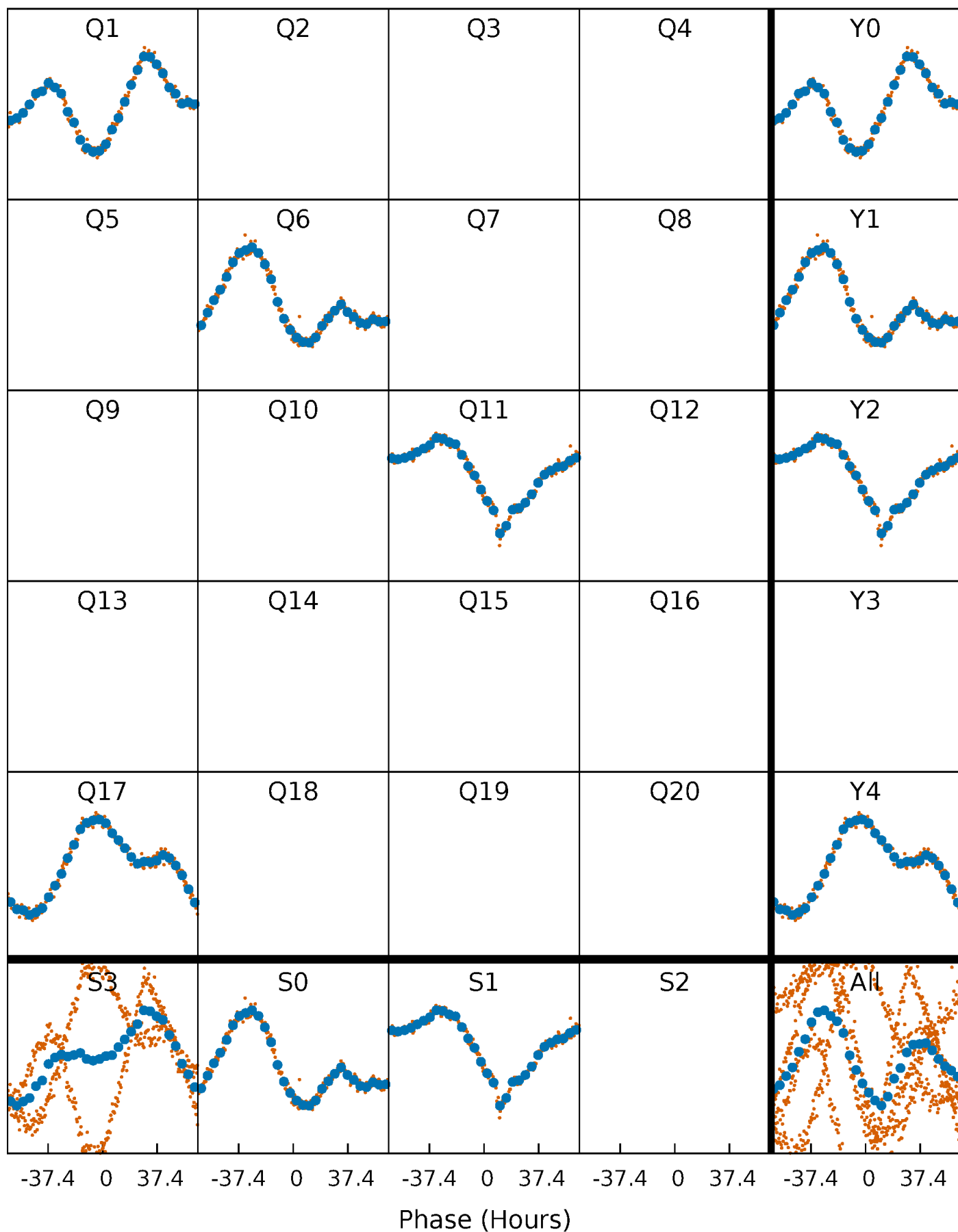


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



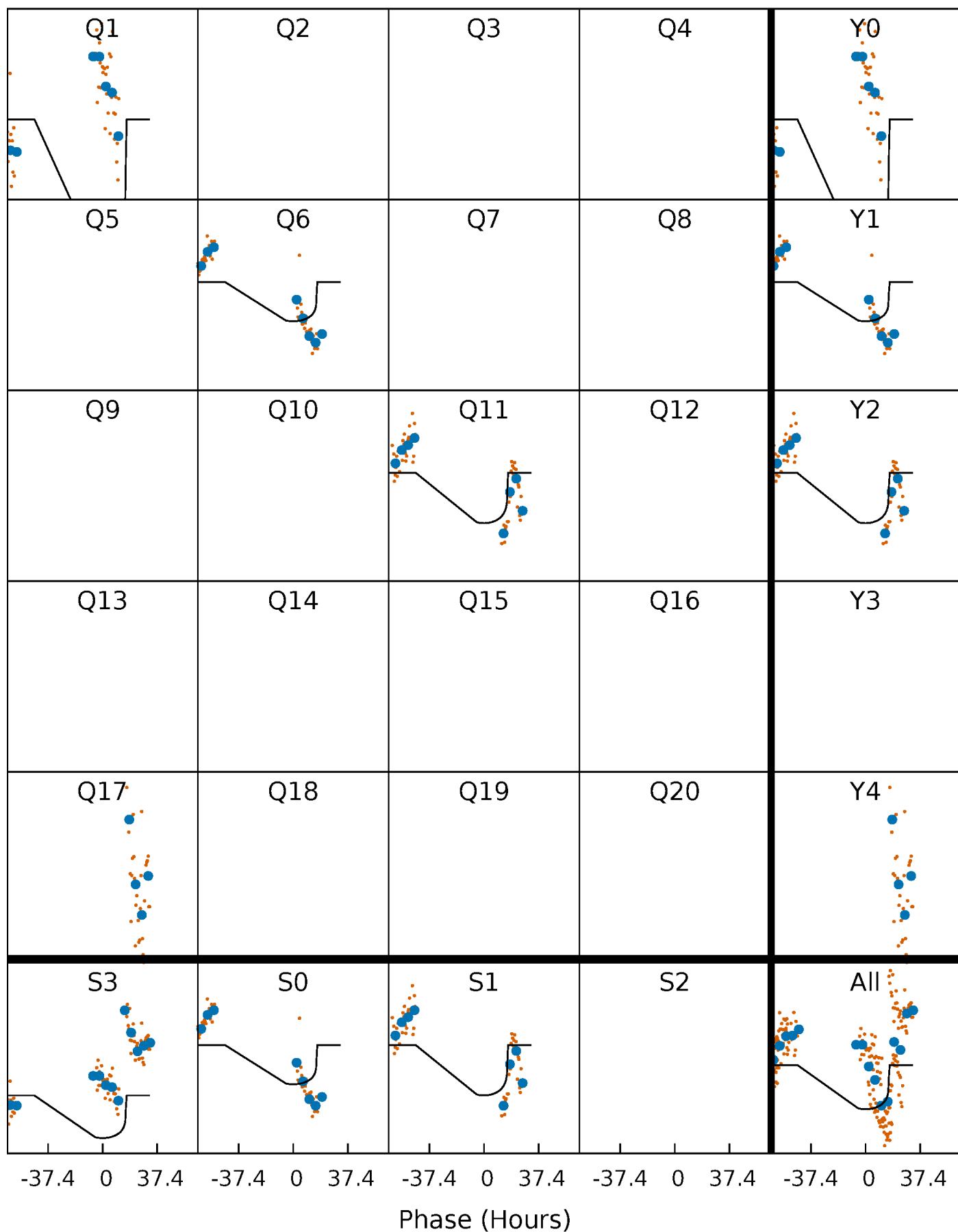
PDC Quarter-Phased Transit Curves

TCE 012457978-07 $P=473.097498$ Days $T_0=147.028236$ (BKJD)



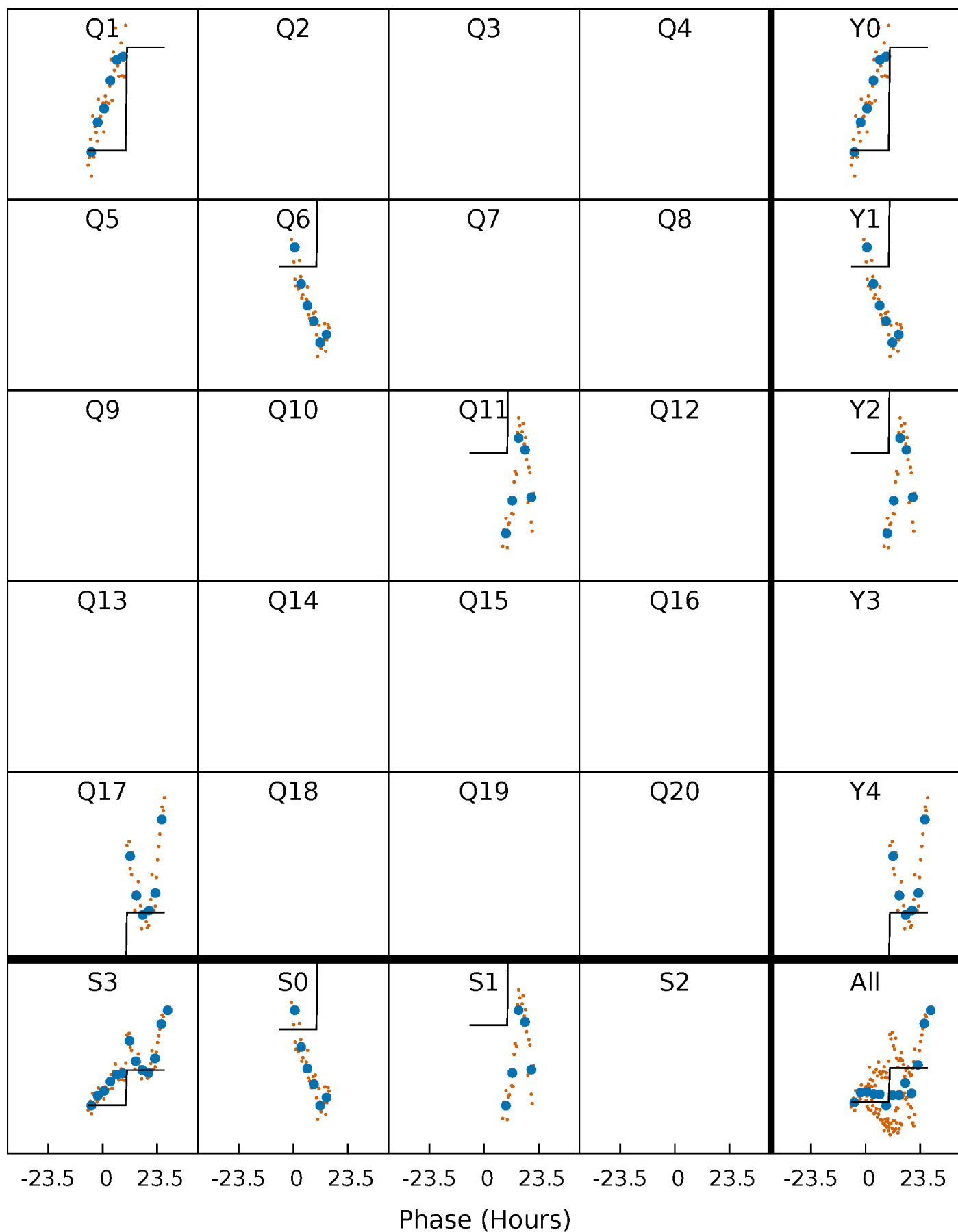
DV Quarter-Phased Transit Curves

TCE 012457978-07 $P=473.097498$ Days $T_0=147.028236$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

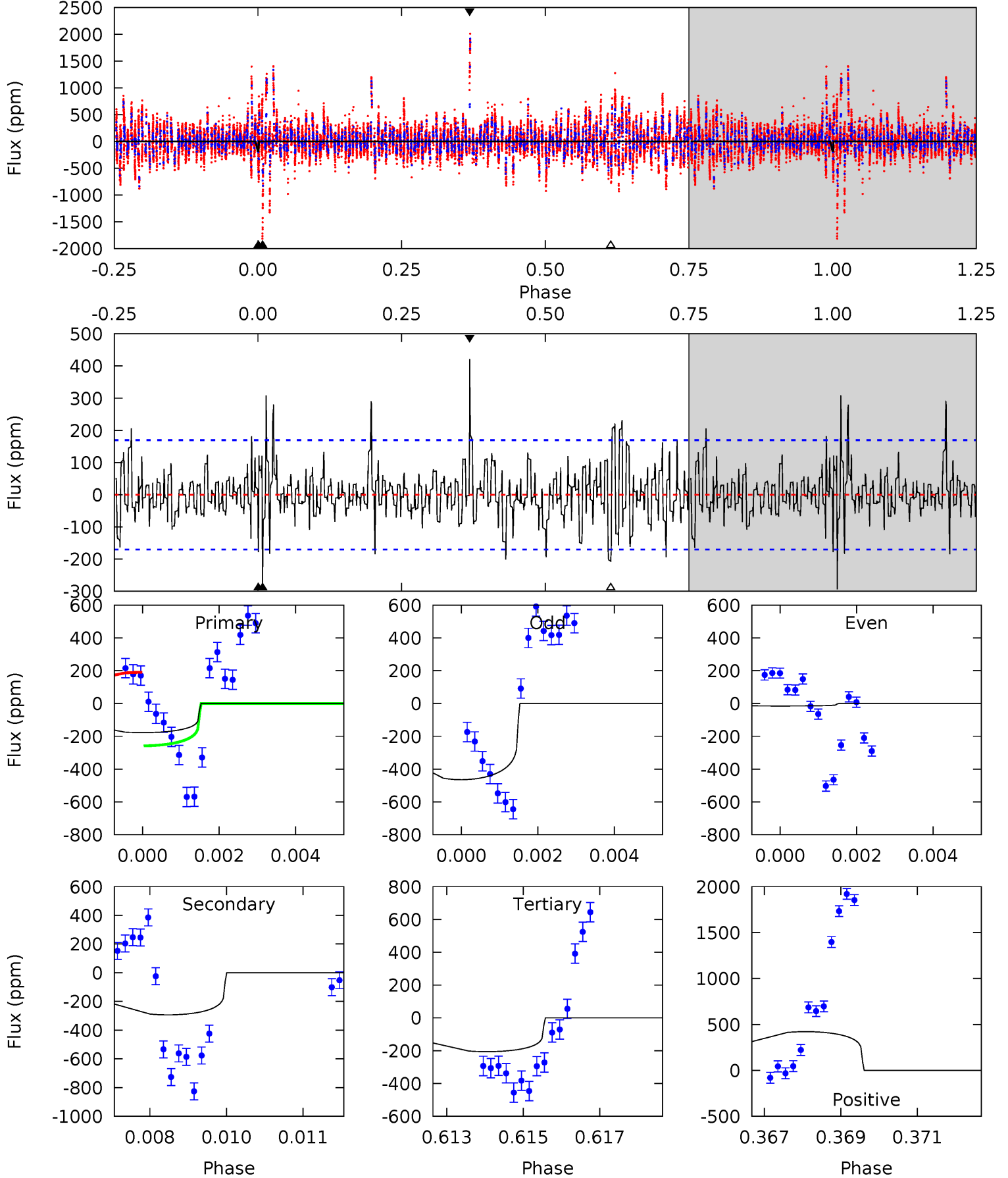
TCE 012457978-07 P=473.159515 Days $T_0=147.075135$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-07, P = 473.097498 Days, E = 147.028236 Days

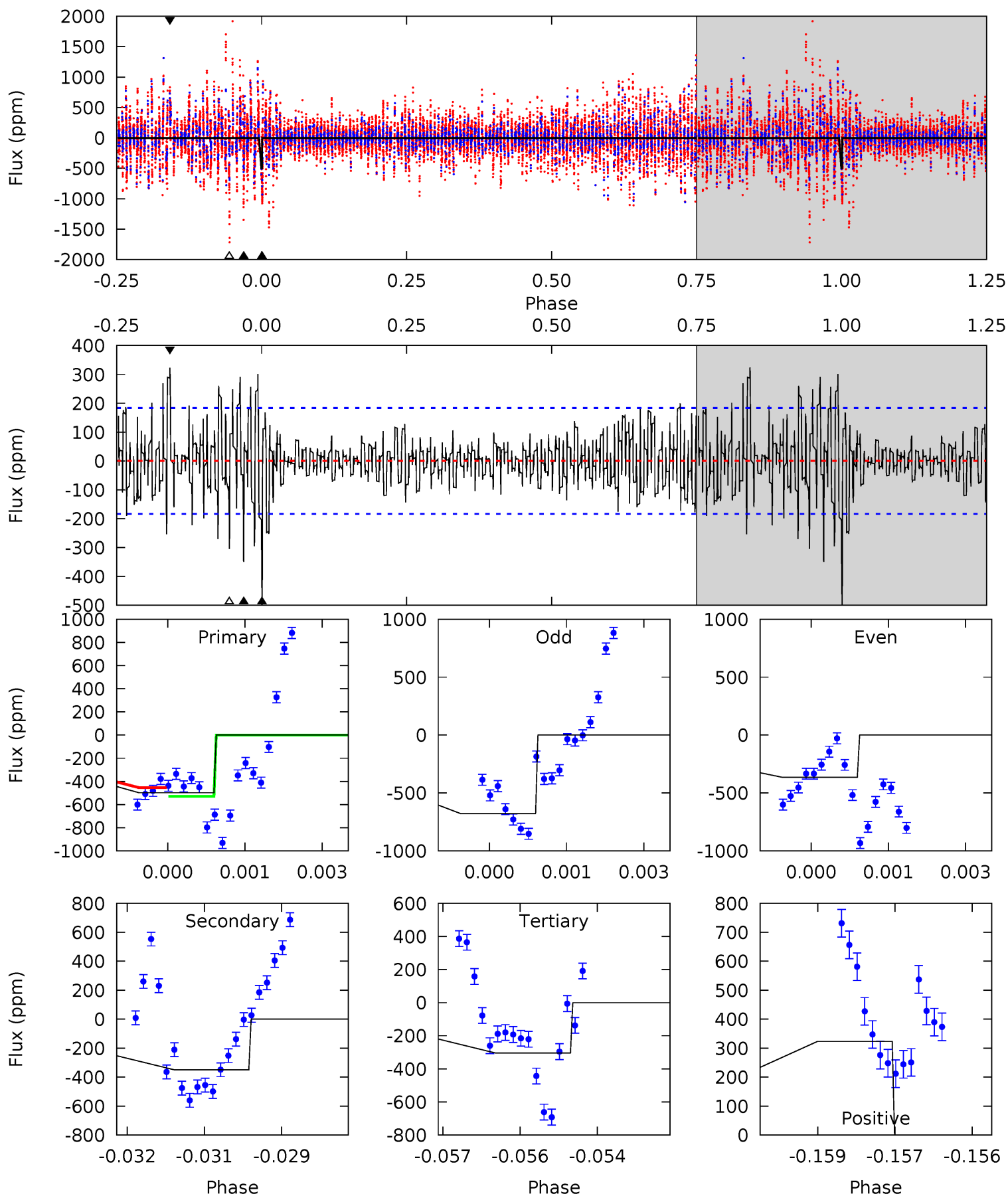
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.58	9.22	6.47	13.2	5.34	3.10	2.24	-0.89	-7.65	2.74	-4.01	7.16	0.71	0.59	0.75



Alt Model-Shift Uniqueness Test

012457978-07, P = 473.159515 Days, E = 147.075135 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	10.3	8.95	9.49	5.38	3.18	2.31	5.68	5.14	1.31	0.77	4.51	0.93	0.39	0.85



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-293 ± 32	$5.53^{+4.09}_{-3.29}$	583^{+34}_{-51}	6387^{+4815}_{-1368}	10496^{+53532}_{-6833}
Alt.	-349 ± 34	$6.57^{+4.08}_{-3.27}$	583^{+35}_{-51}	6038^{+2852}_{-1026}	9005^{+25847}_{-5714}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

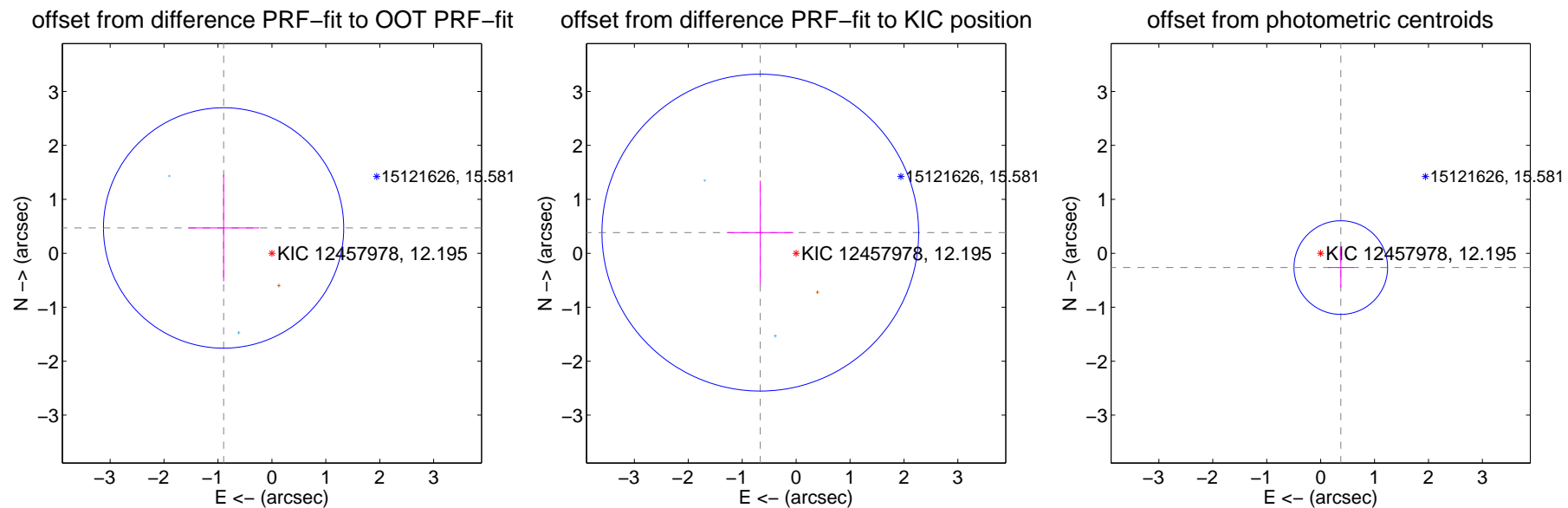
DV Centroid Data

Supplemental centroid analysis for 012457978-07. Kepler magnitude: 12.20. Transit SNR 7.16

There are 2 quarters with good PRF difference image offsets

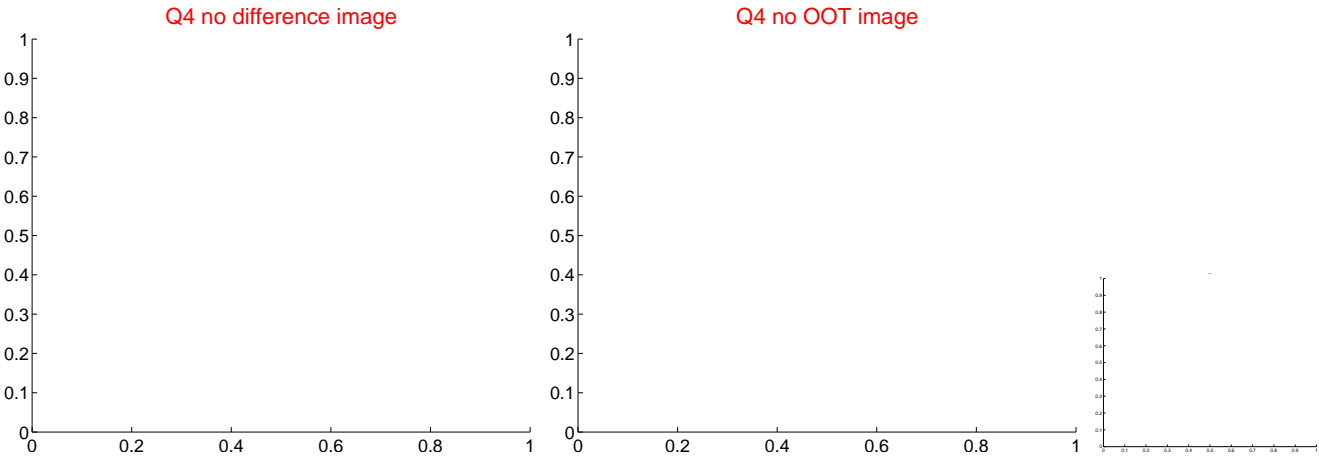
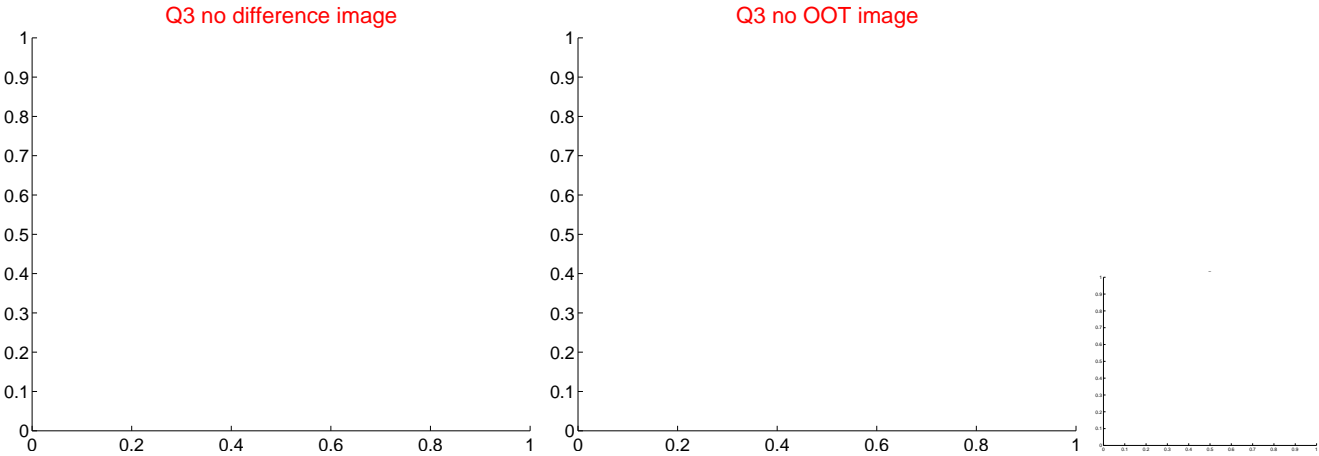
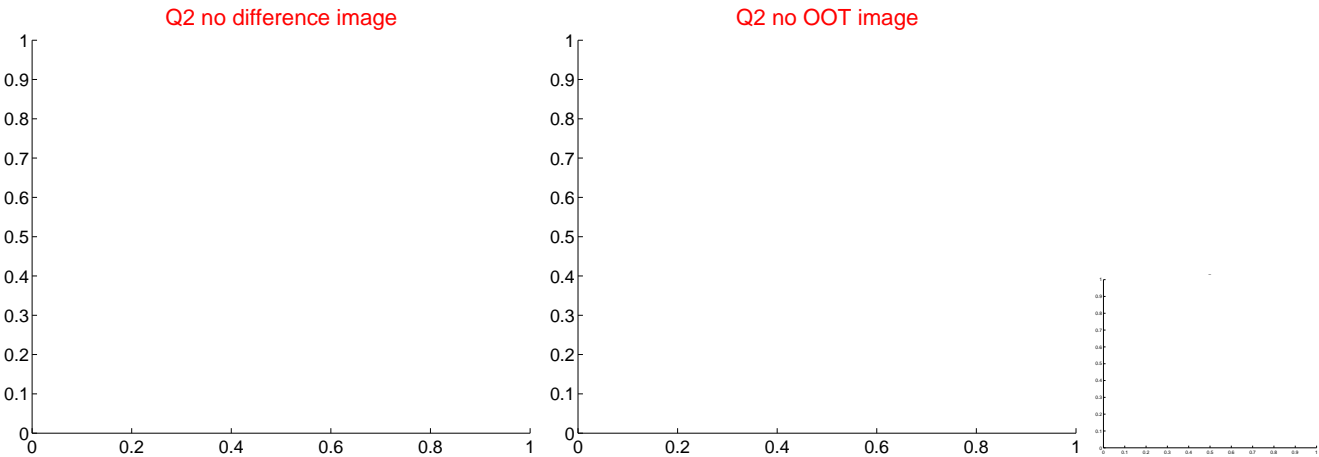
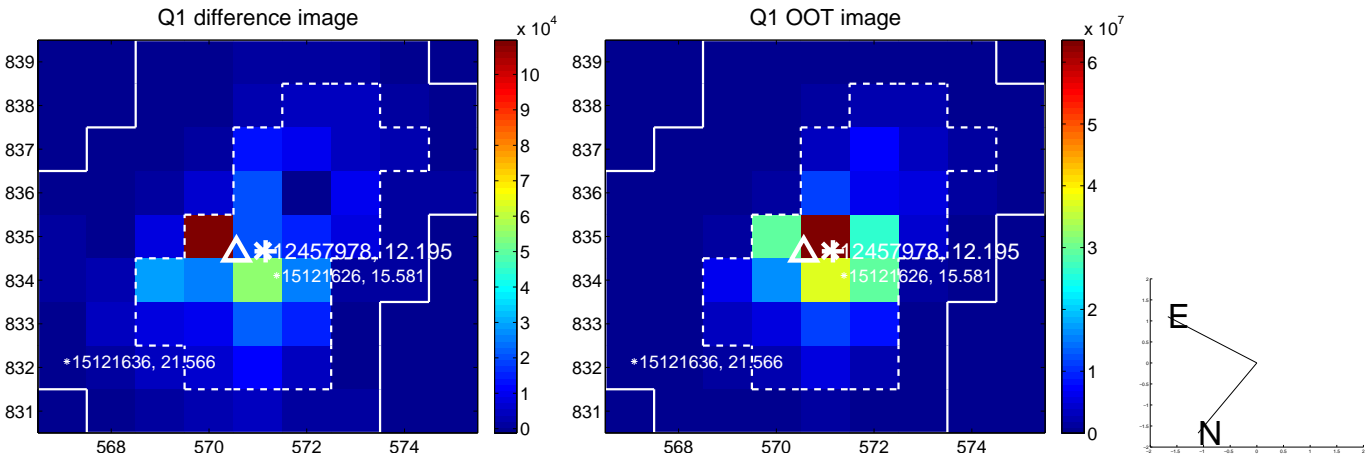
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.011 ± 0.743	1.36	0.896 ± 0.659	0.469 ± 0.990
PRF-fit source offset from KIC position	0.767 ± 0.979	0.78	0.664 ± 0.616	0.383 ± 0.963
photometric centroid source offset	0.46 ± 0.29	1.58	-0.37 ± 0.24	-0.26 ± 0.37

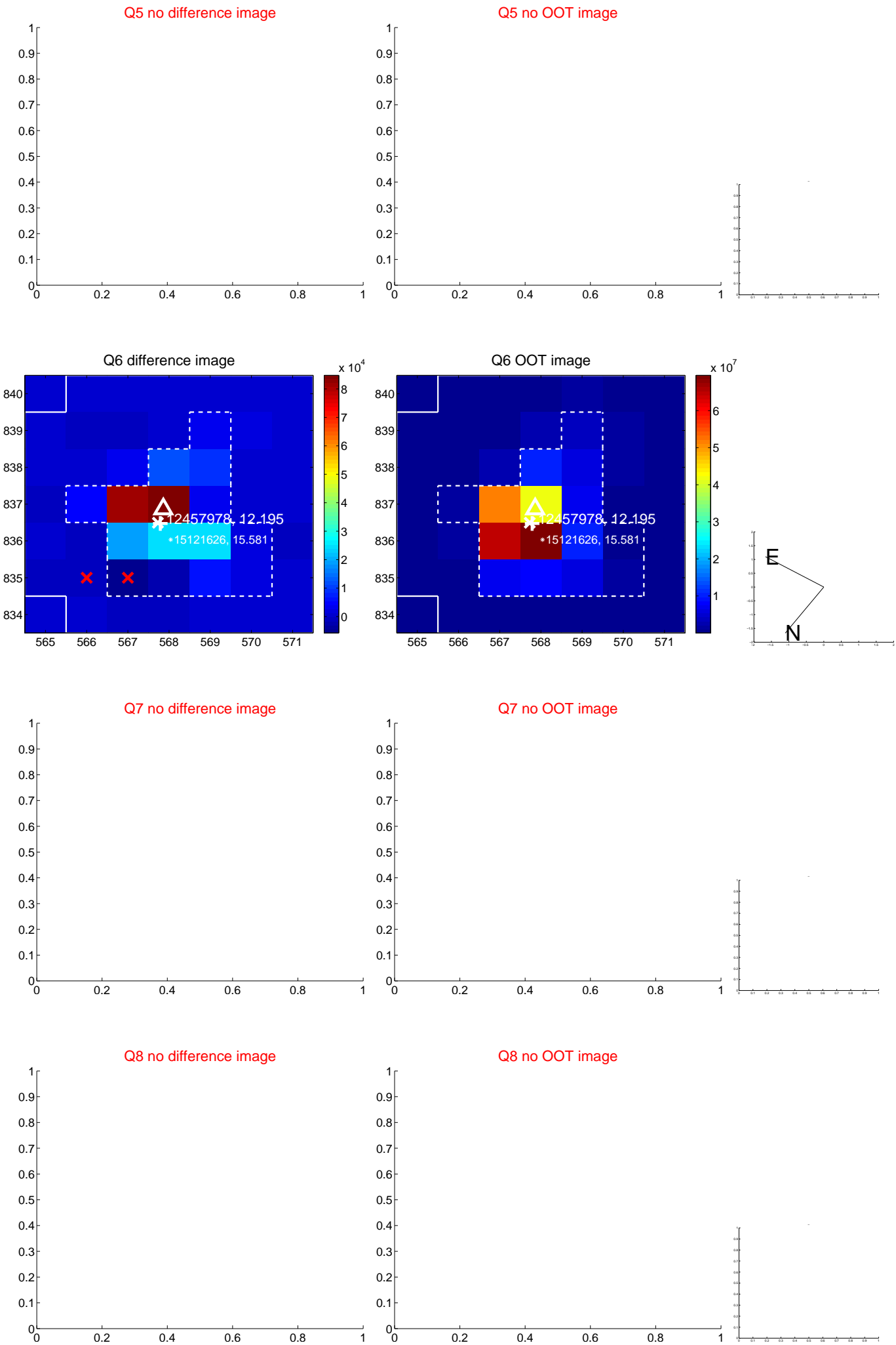


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



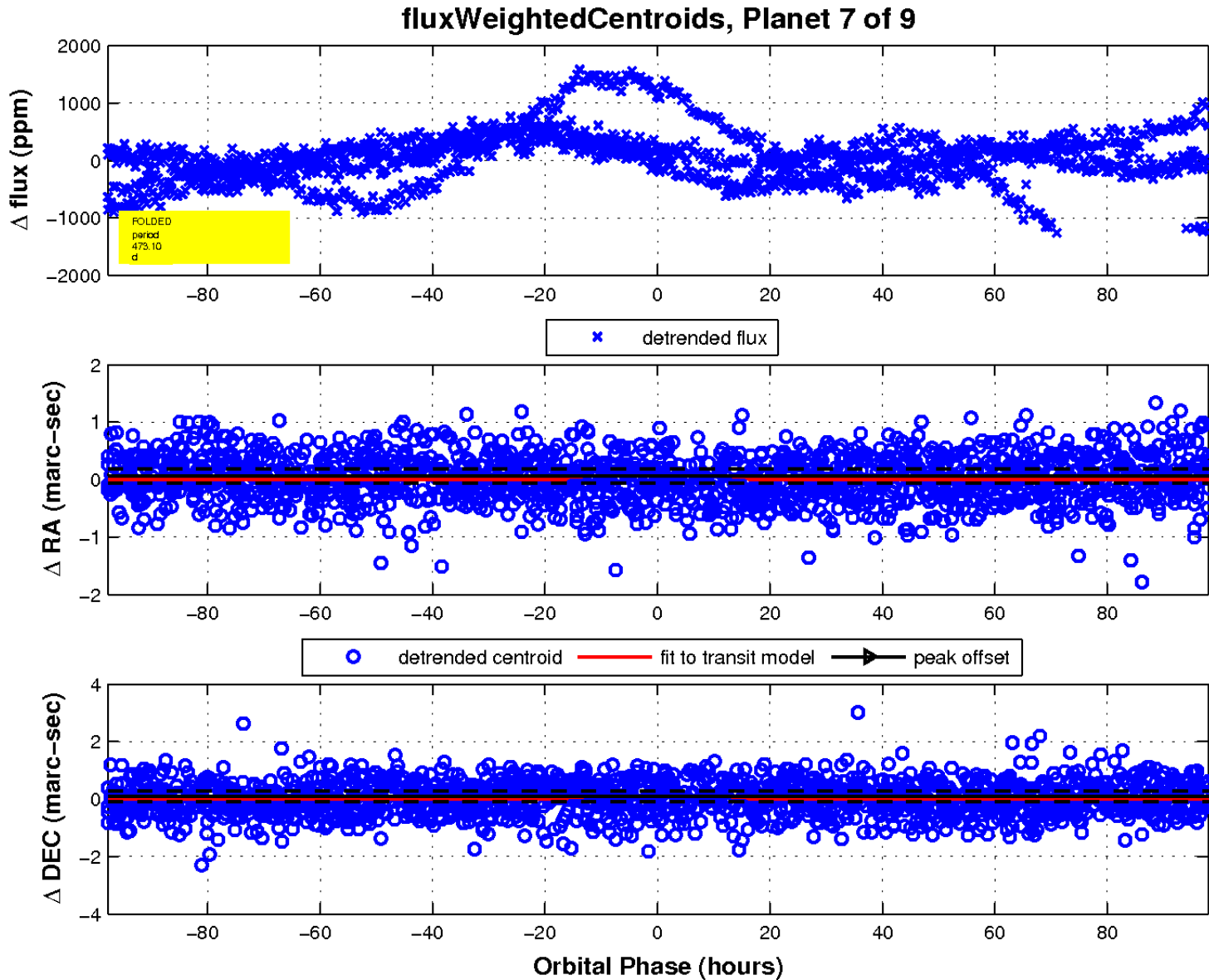
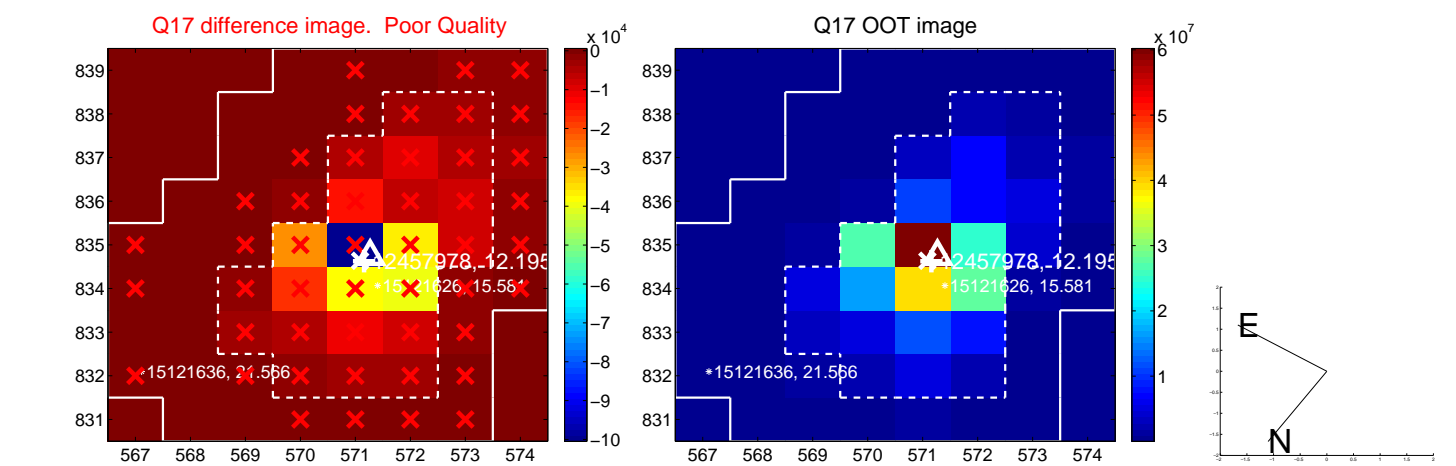
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

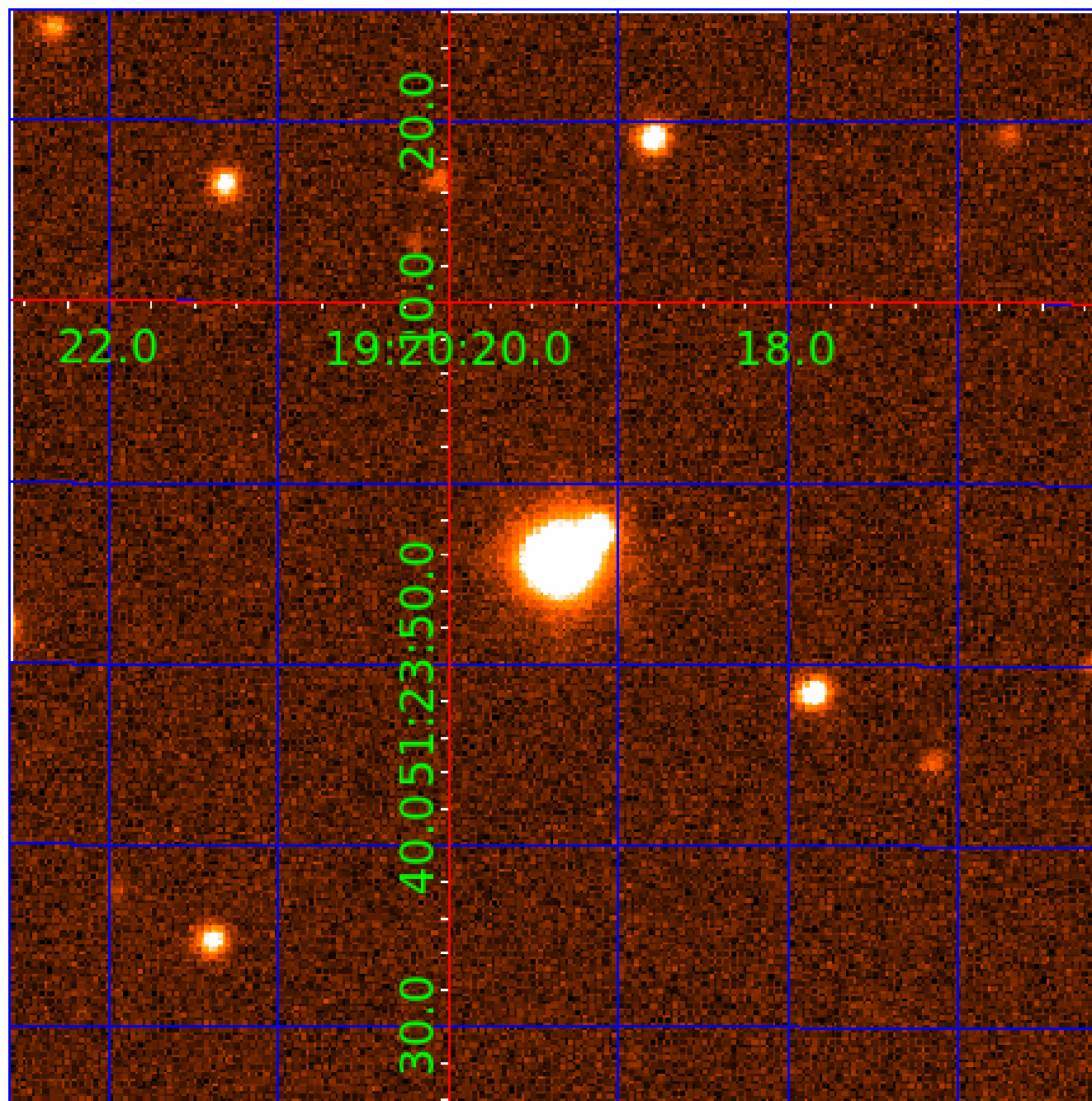


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012457978-01	OBS	No	2.996126	133.677816	48.9	18.223	9.3	10.3	2.65	7042	2.73	6566.20
012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
012457978-04	OBS	No	135.937663	132.859609	108.2	12.500	10.1	-1.0	2.65	7042	2.78	40.58
012457978-05	OBS	No	198.941456	229.817443	291.7	19.769	8.6	6.2	2.65	7042	5.04	24.42
012457978-06	OBS	No	227.754759	177.386345	199.5	17.701	7.9	6.5	2.65	7042	4.51	20.39
012457978-07	OBS	No	473.097498	147.028236	411.9	32.694	8.5	7.2	2.65	7042	5.42	7.69
012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
012457978-09	OBS	No	96.645094	200.554156	151.8	6.960	7.6	5.9	2.65	7042	3.71	63.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

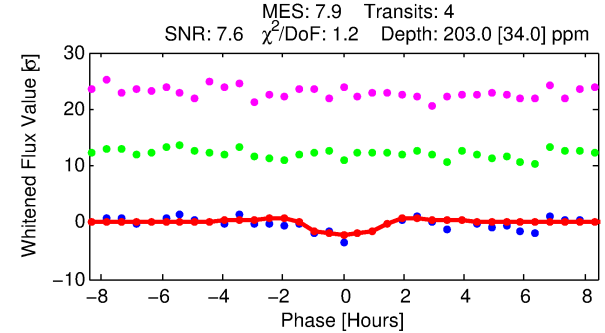
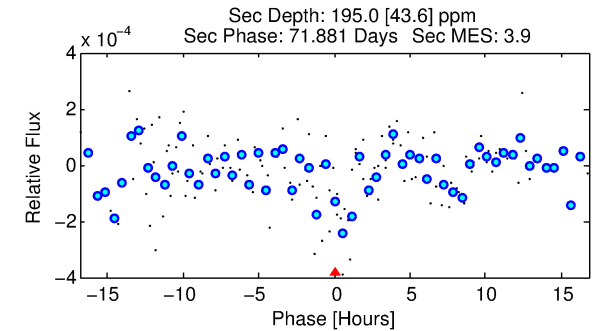
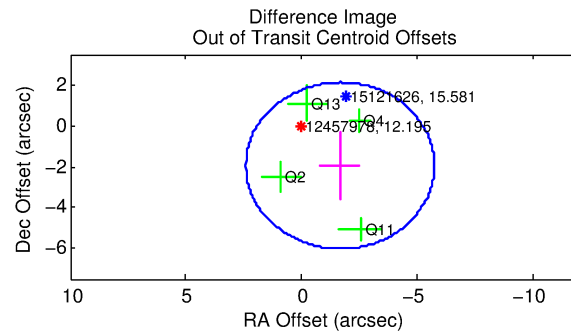
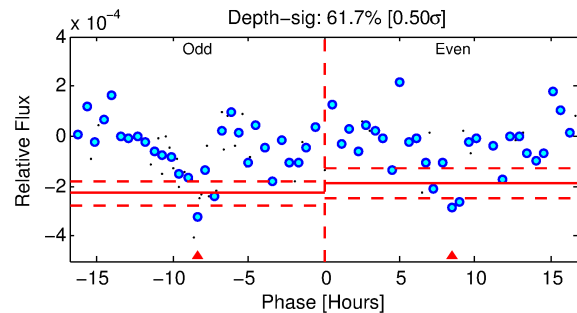
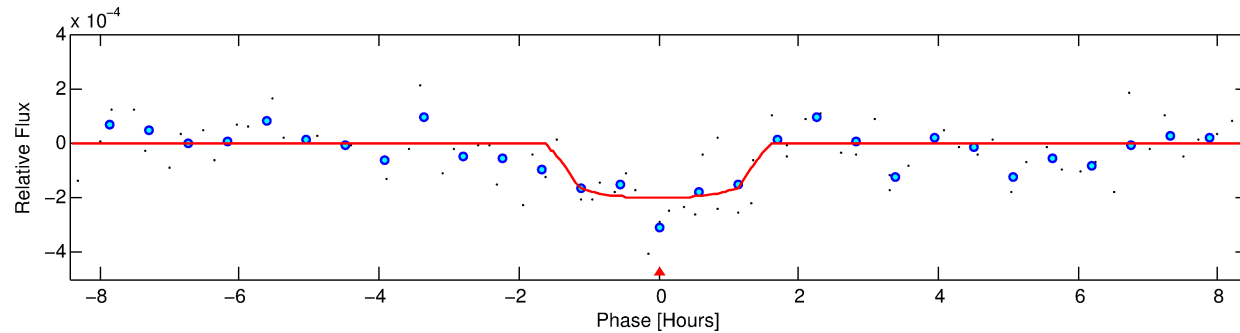
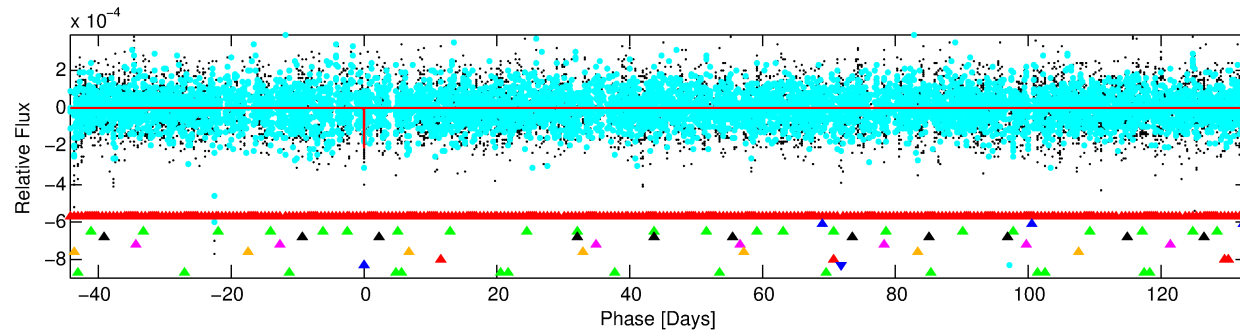
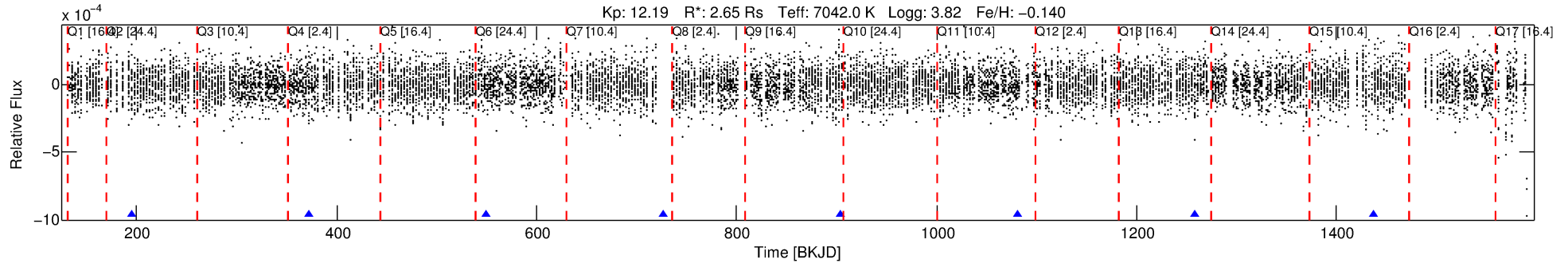
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-08

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 8 of 9 Period: 177.345 d



DV Fit Results:

Period = 177.34499 [0.00182] d
Epoch = 194.8515 [0.0070] BKJD
Rp/R* = 0.0133 [0.0206]
a/R* = 466.31 [3980.72]
b = 0.30 [25.84]
Seff = 28.46 [14.81]
Teq = 589 [77] K
Rp = 3.85 [6.14] Re
a = 0.7378 [0.2420] AU
Ag = 3948.47 [12456.50] [0.32 σ]
Teffp = 7219 [5627] K [1.18 σ]

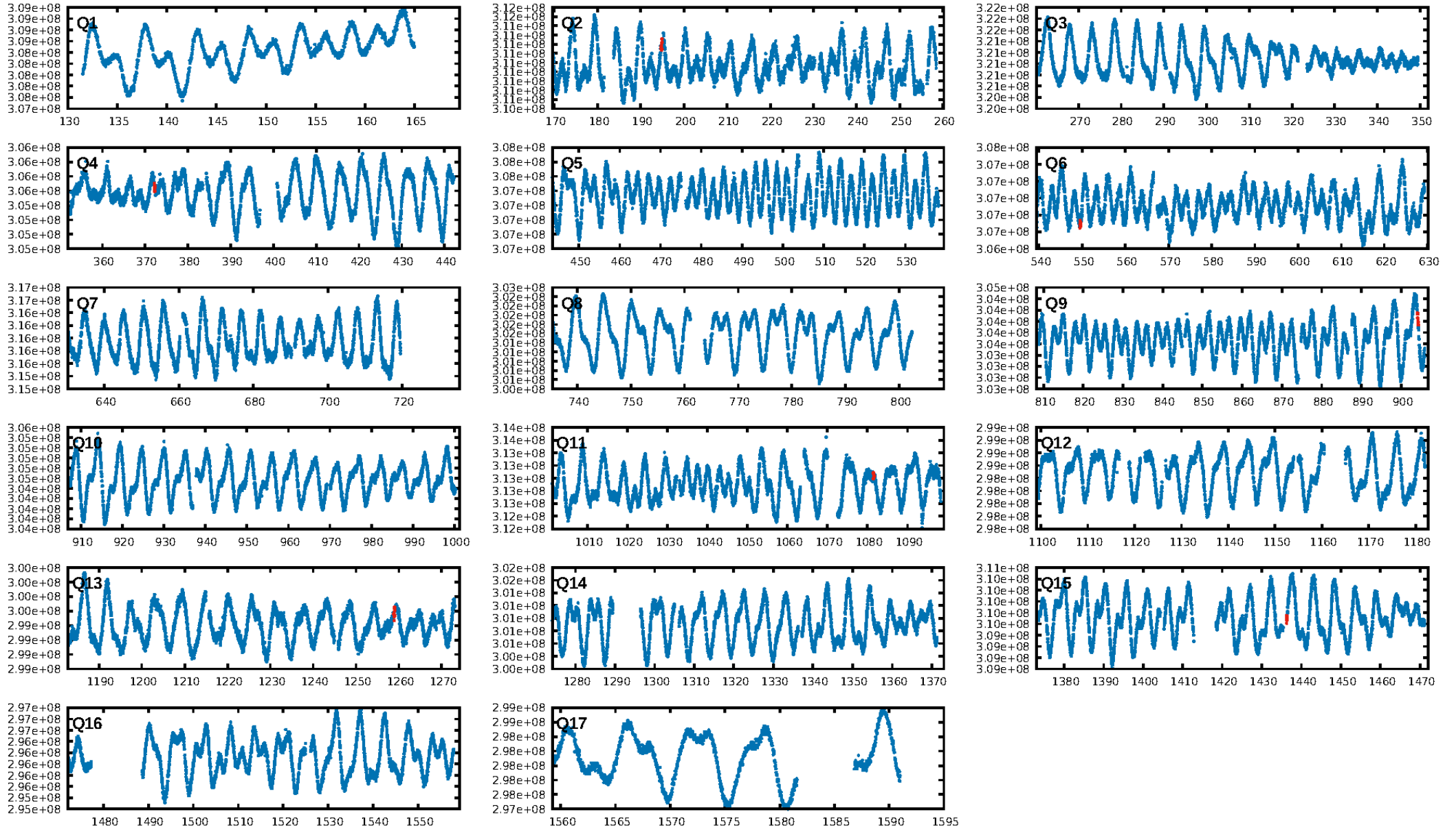
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [77.57 σ]
LongPeriod-sig: 100.0% [25.96 σ]
ModelChiSquare2-sig: 20.4%
ModelChiSquareGof-sig: 97.5%
Bootstrap-pfa: 5.12e-08
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.3581
Centroid-sig: 95.0%
Centroid-so: 0.502 arcsec [0.45 σ]
OotOffset-rm: 2.567 arcsec [1.89 σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-rm: 2.755 arcsec [2.09 σ]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 0.67 [4/6]

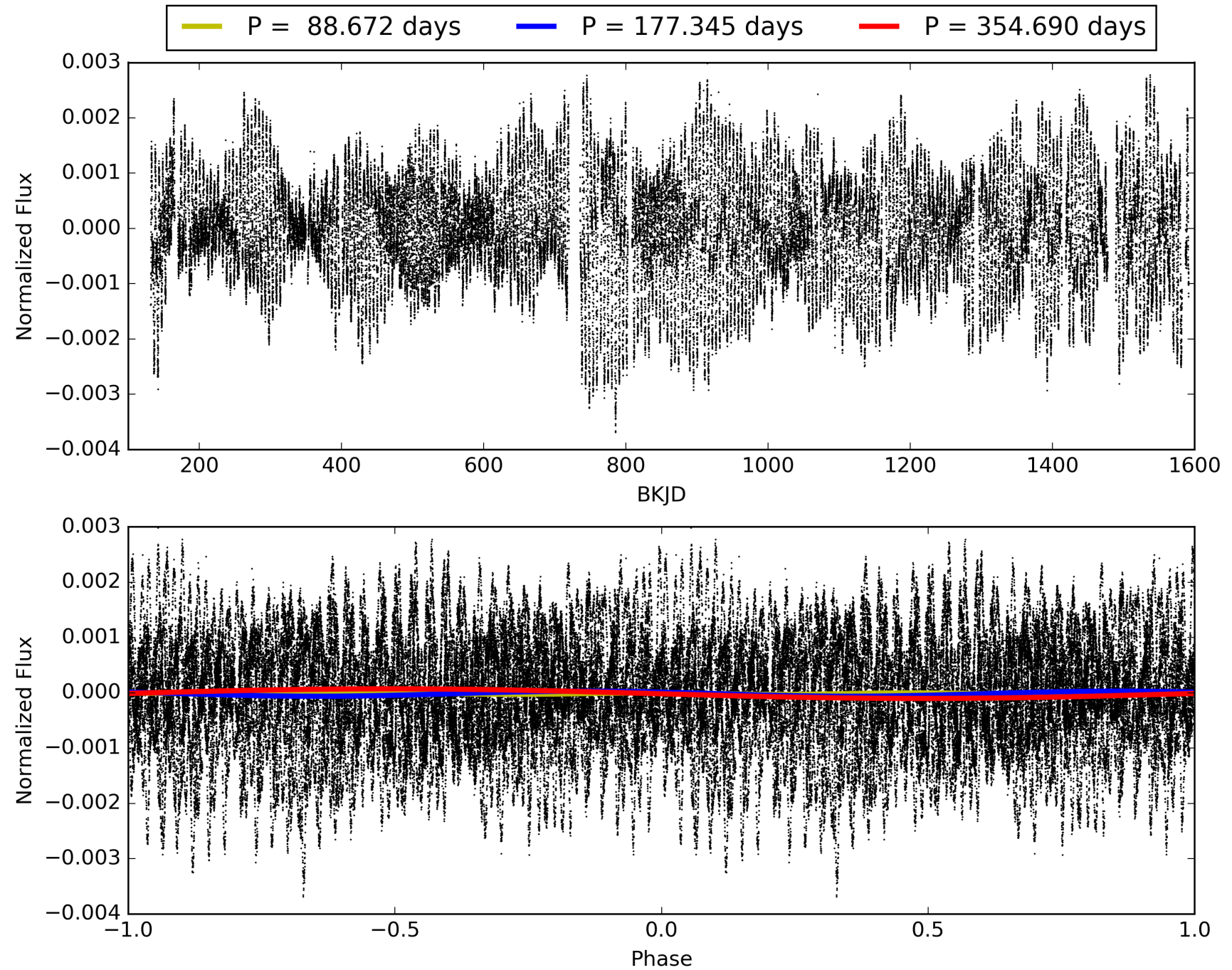
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:22:14 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-08, PDC Light Curves

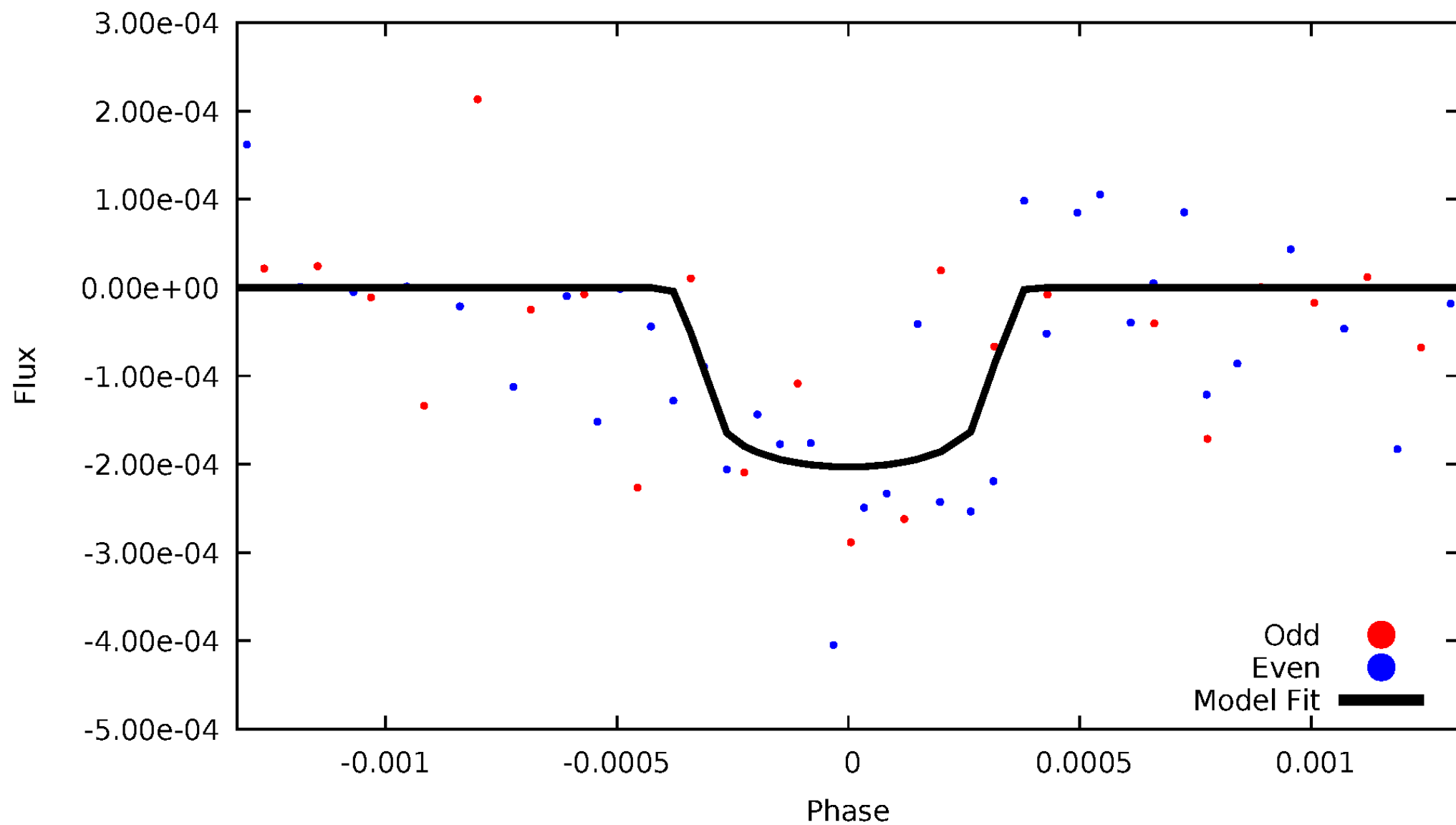


TCE 012457978-08



DV Odd/Even

TCE 012457978-08

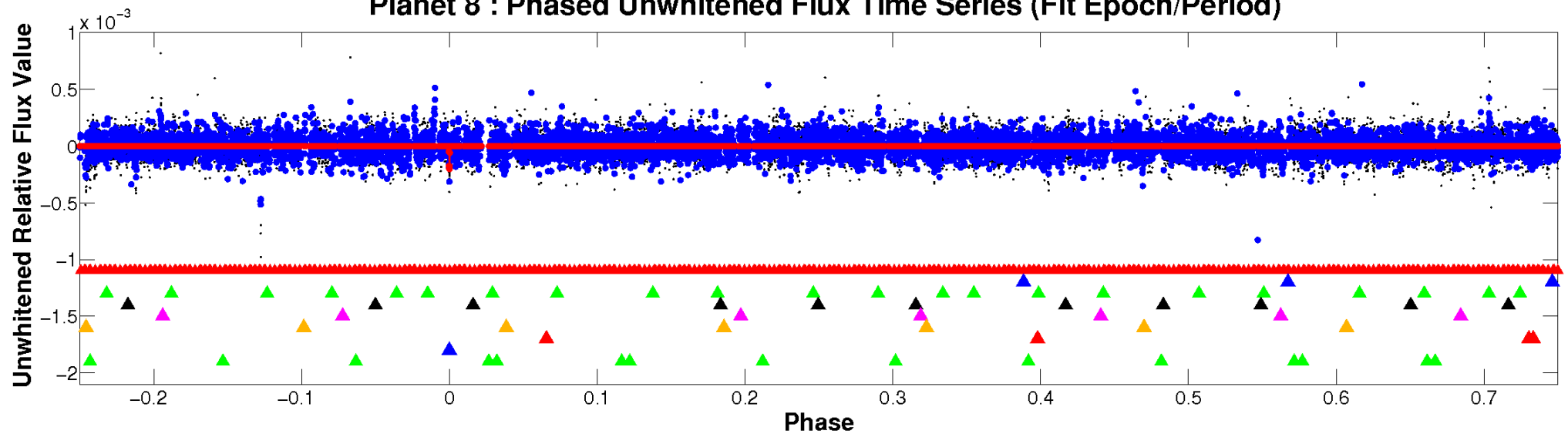


ALT Odd/Even

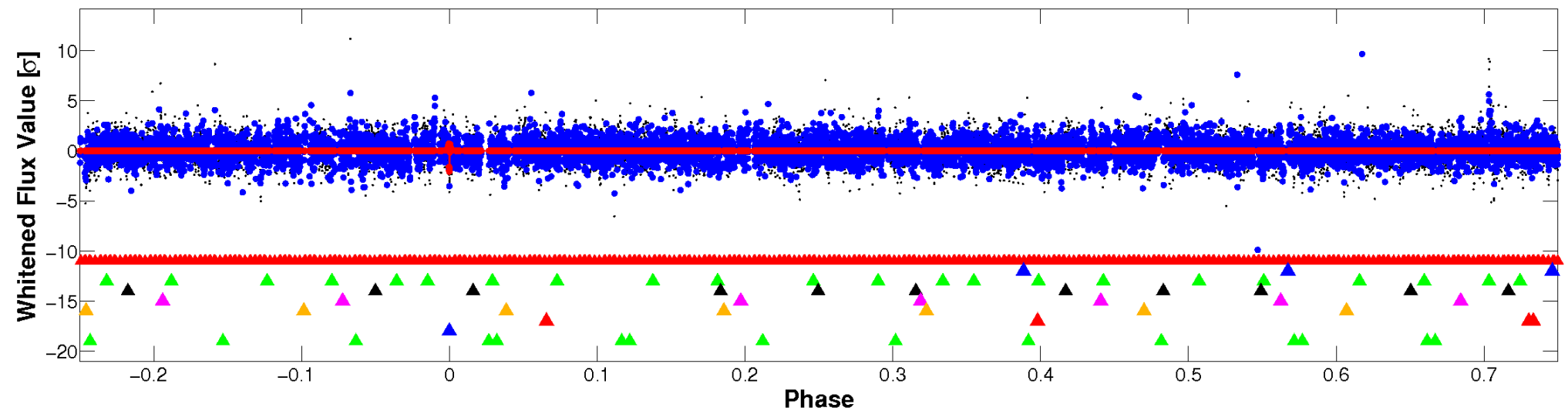
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

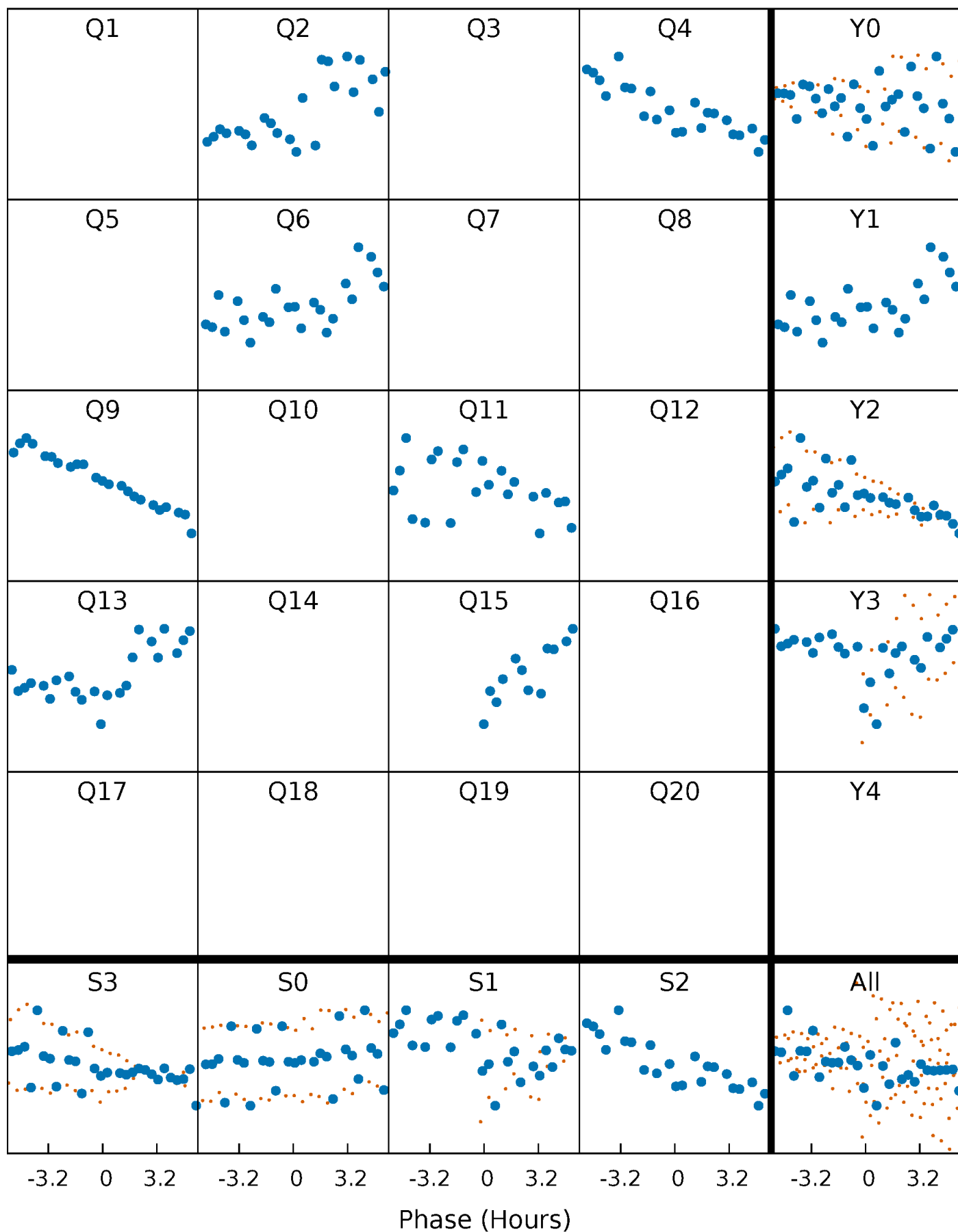


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



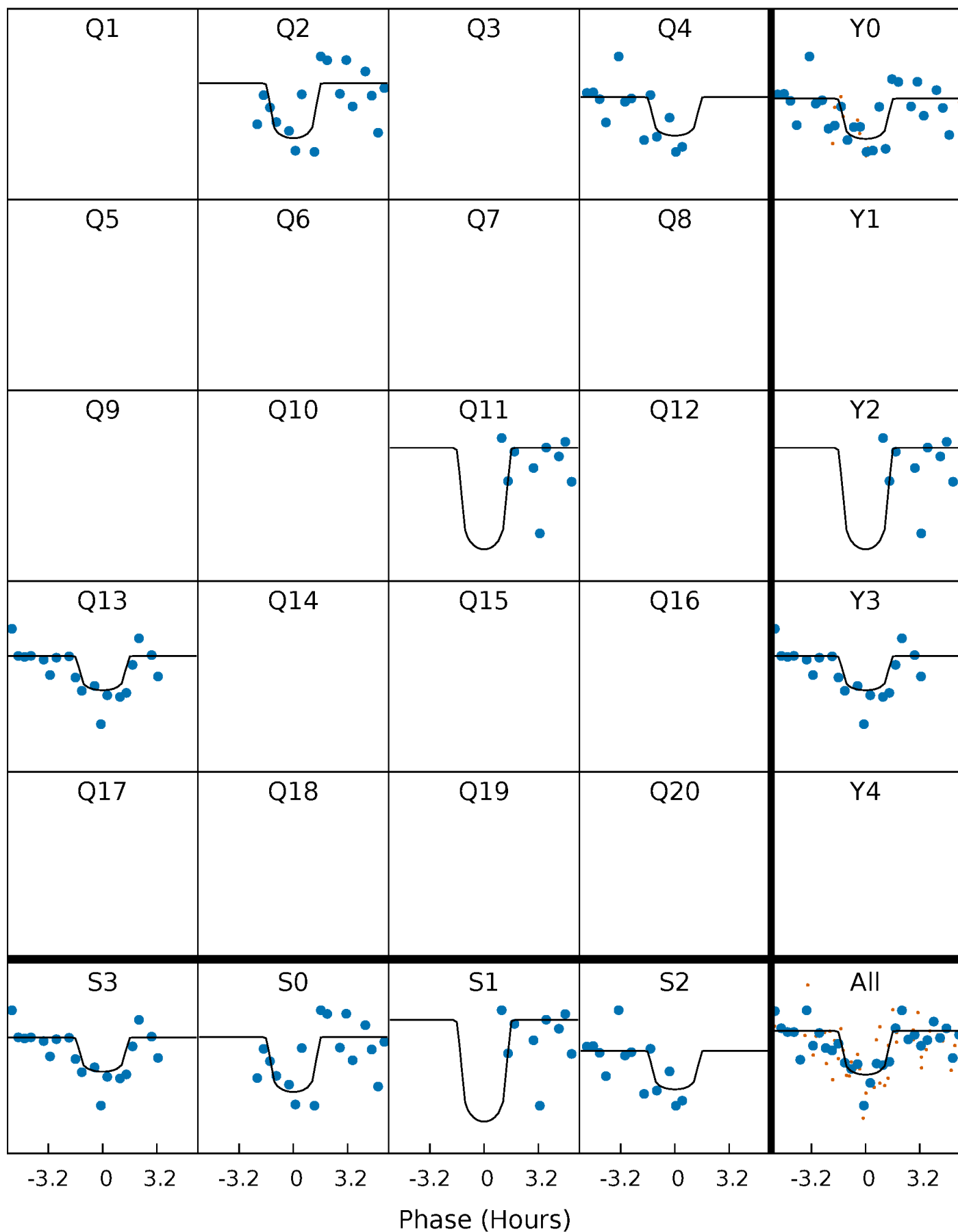
PDC Quarter-Phased Transit Curves

TCE 012457978-08 $P=177.344991$ Days $T_0=194.851549$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012457978-08 P=177.344991 Days $T_0=194.851549$ (BKJD)

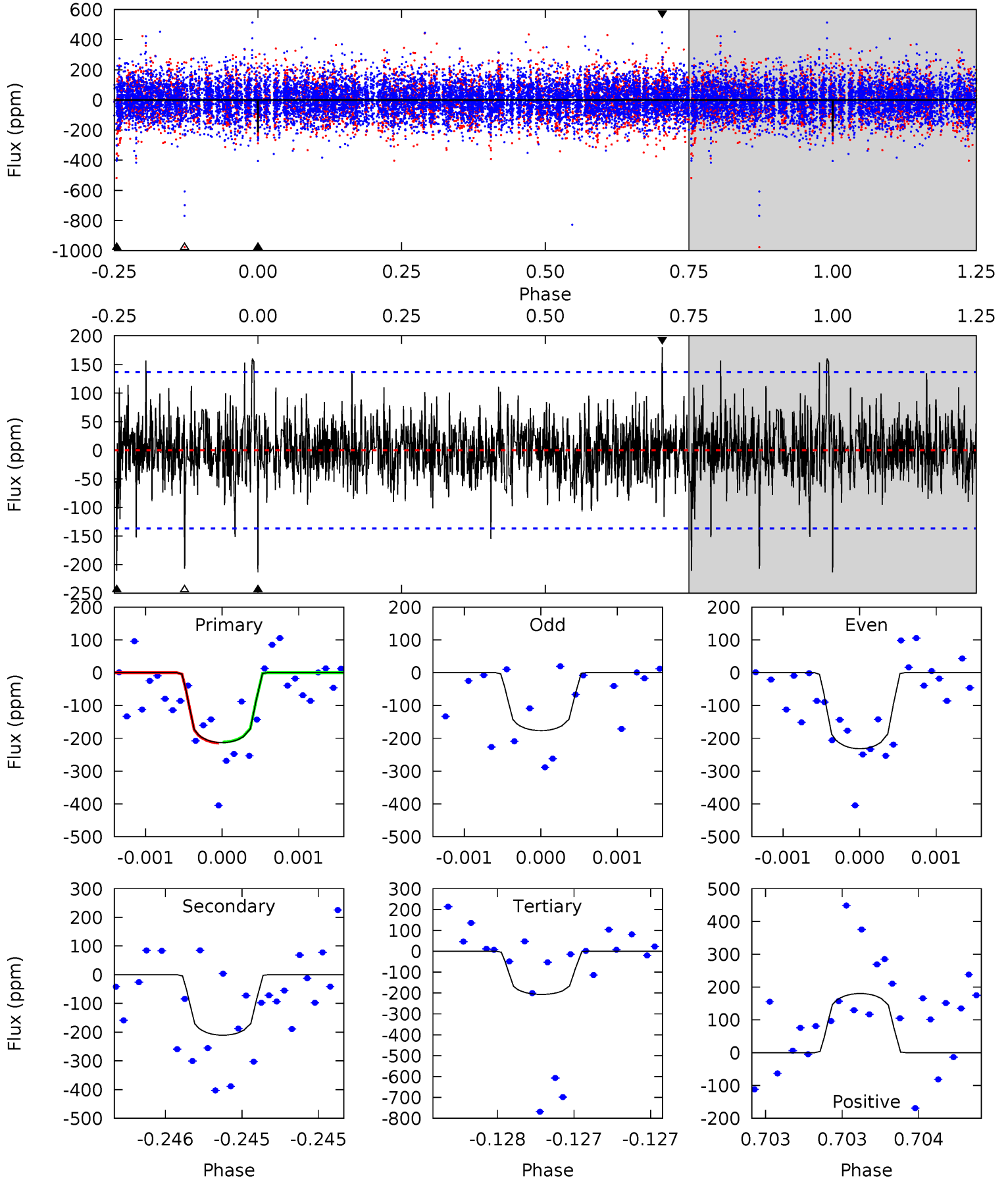


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

012457978-08, P = 177.344991 Days, E = 17.506558 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.61	8.51	8.35	7.28	5.51	3.38	1.57	0.26	1.33	0.15	1.23	1.06	0.86	0.46	0.06



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-08 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-211 ± 25	$5.50^{+5.54}_{-3.56}$	810^{+44}_{-76}	5840^{+5509}_{-1395}	2076^{+15548}_{-1546}
Alt.	N/A	N/A	N/A	N/A	N/A

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

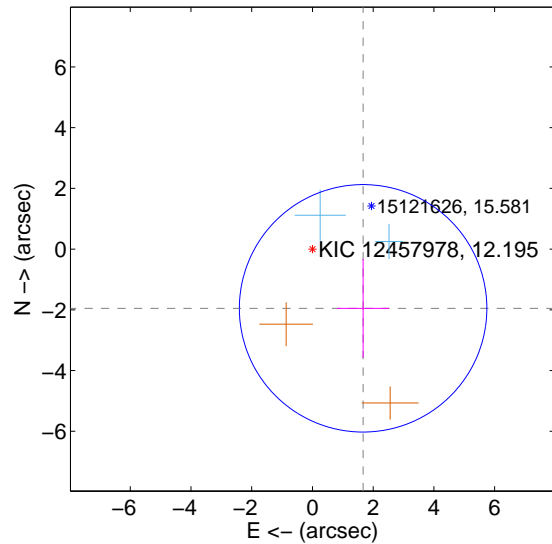
Supplemental centroid analysis for 012457978-08. Kepler magnitude: 12.20. Transit SNR 7.62

There are 2 quarters with good PRF difference image offsets

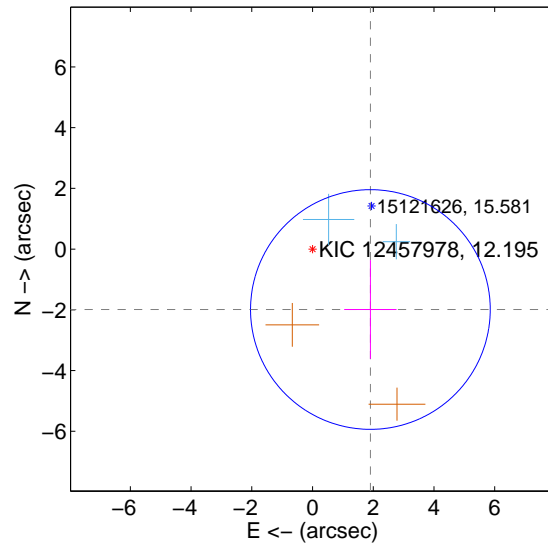
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.567 ± 1.359	1.89	-1.669 ± 0.858	-1.951 ± 1.630
PRF-fit source offset from KIC position	2.755 ± 1.316	2.09	-1.906 ± 0.862	-1.990 ± 1.624
photometric centroid source offset	0.50 ± 1.10	0.45	-0.50 ± 1.10	0.04 ± 1.48

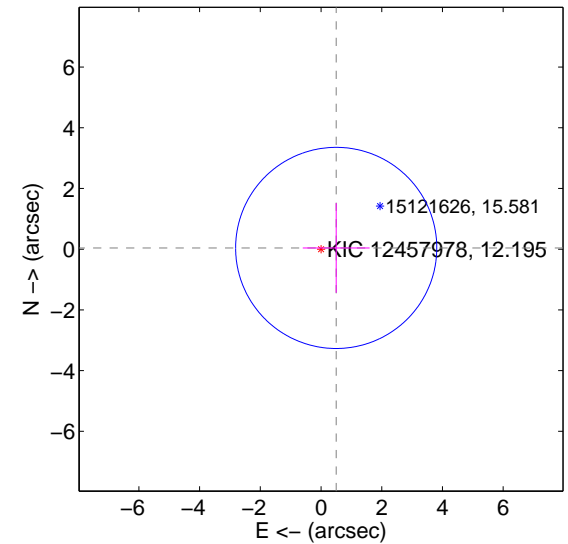
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

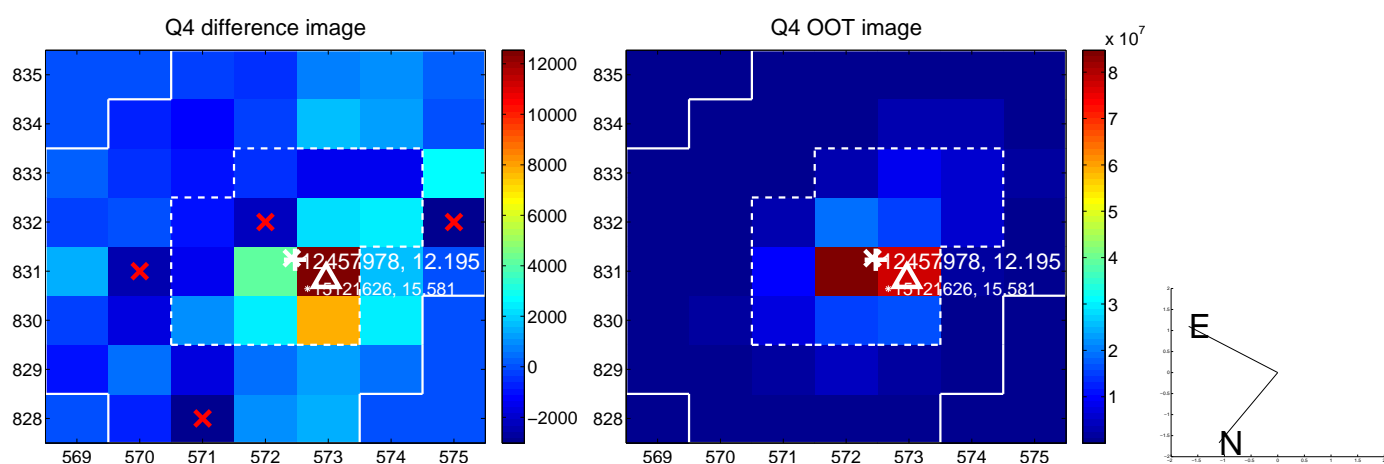
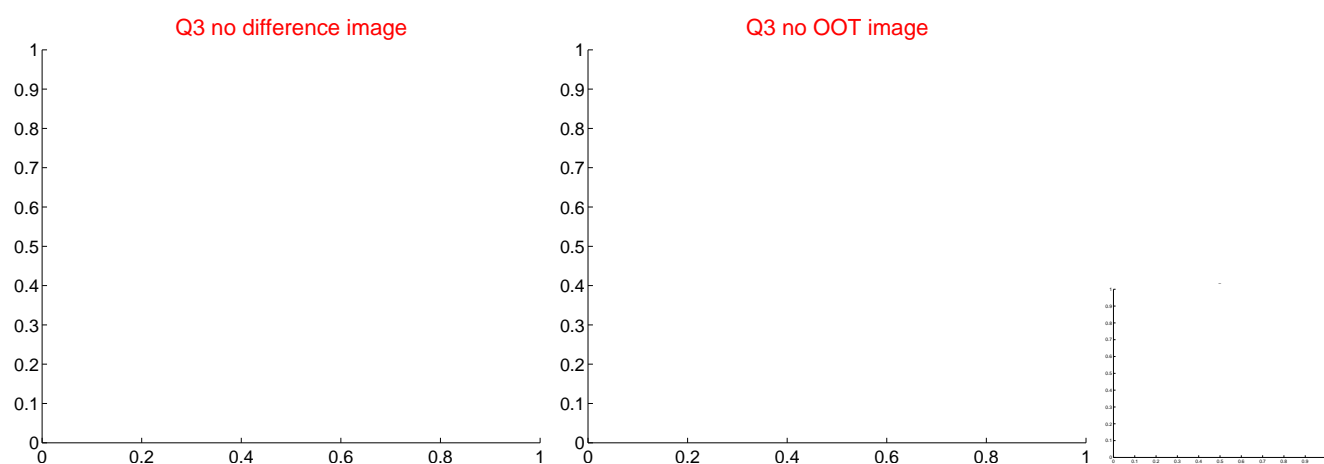
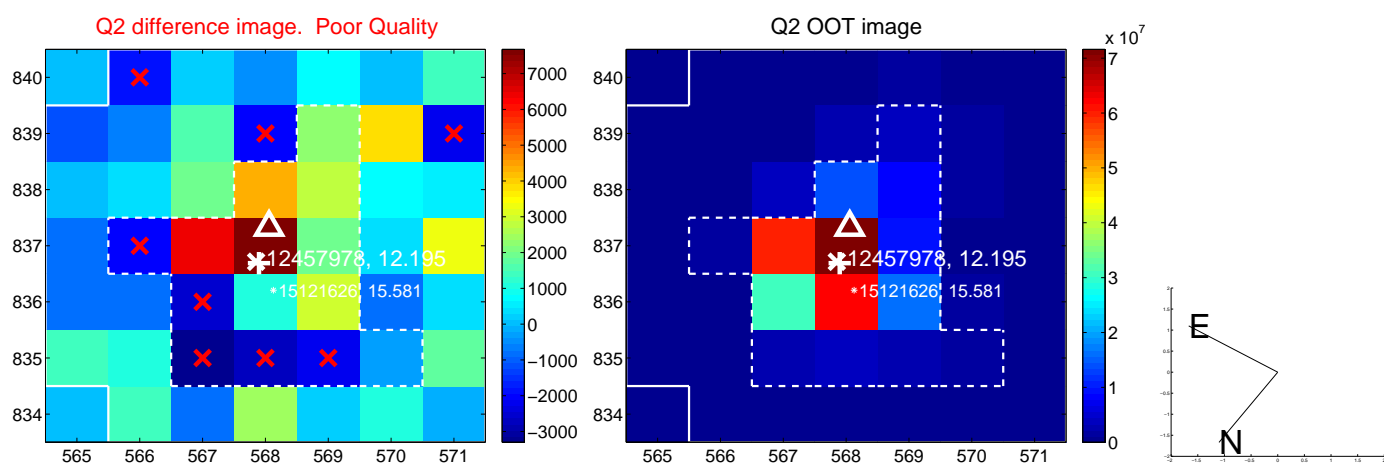
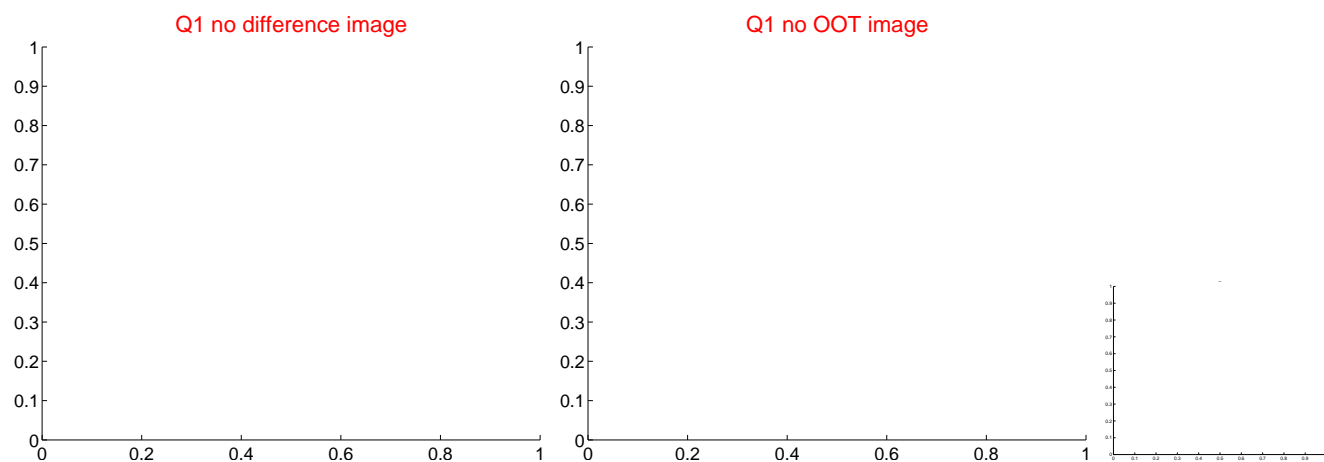


offset from photometric centroids

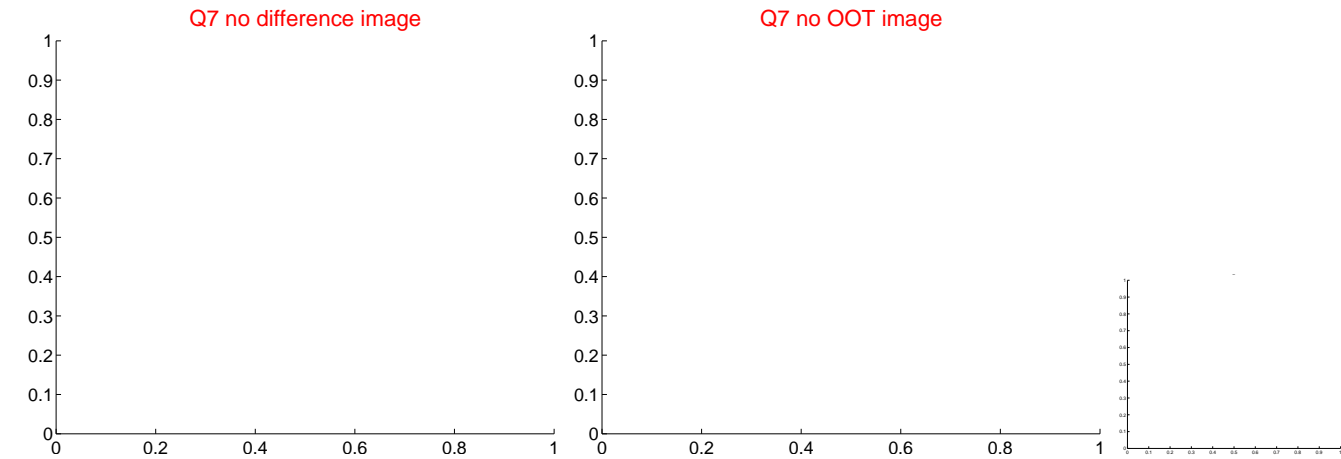
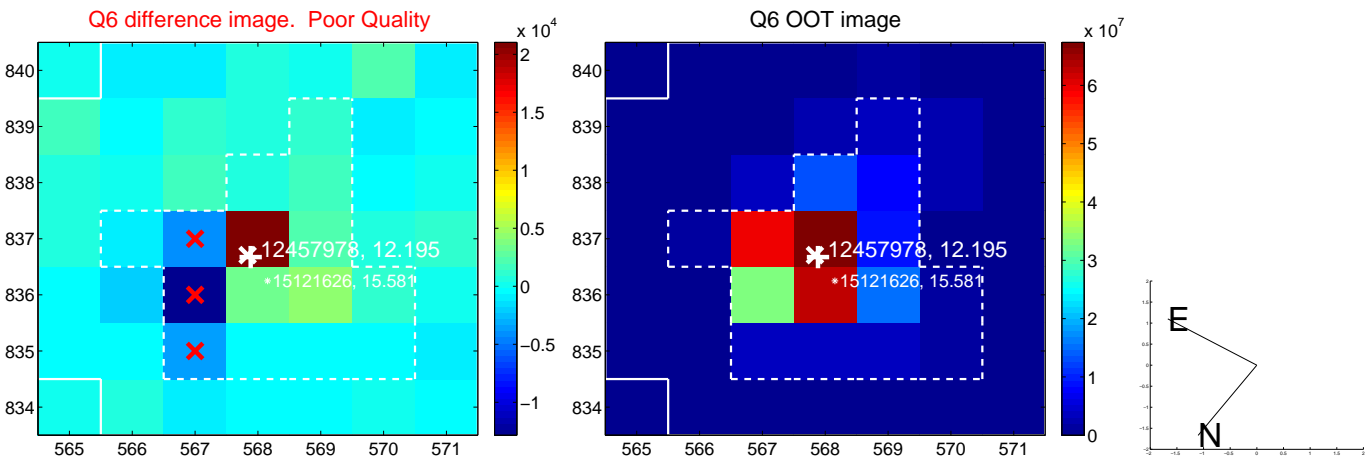


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

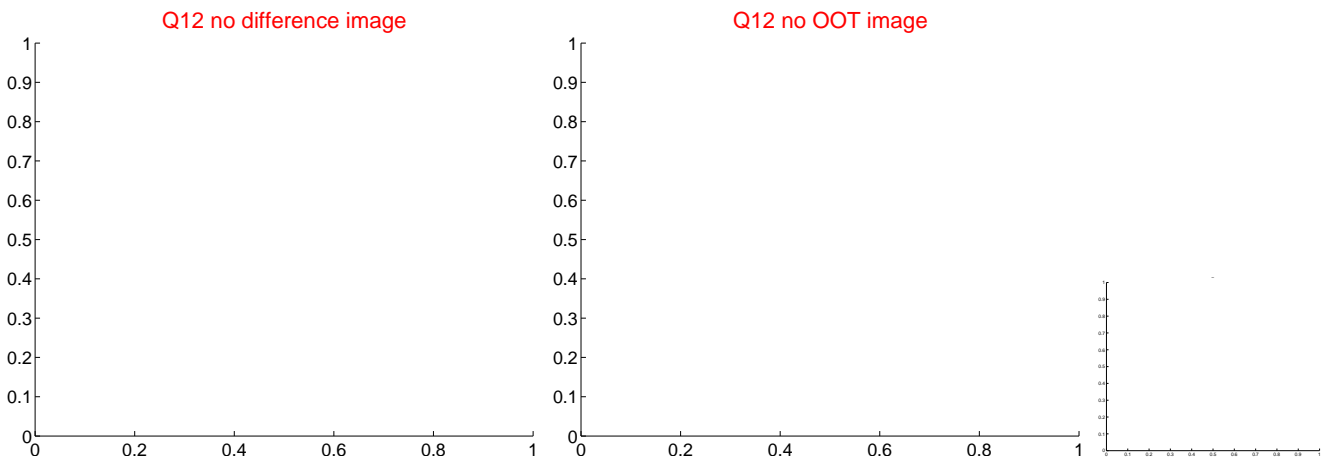
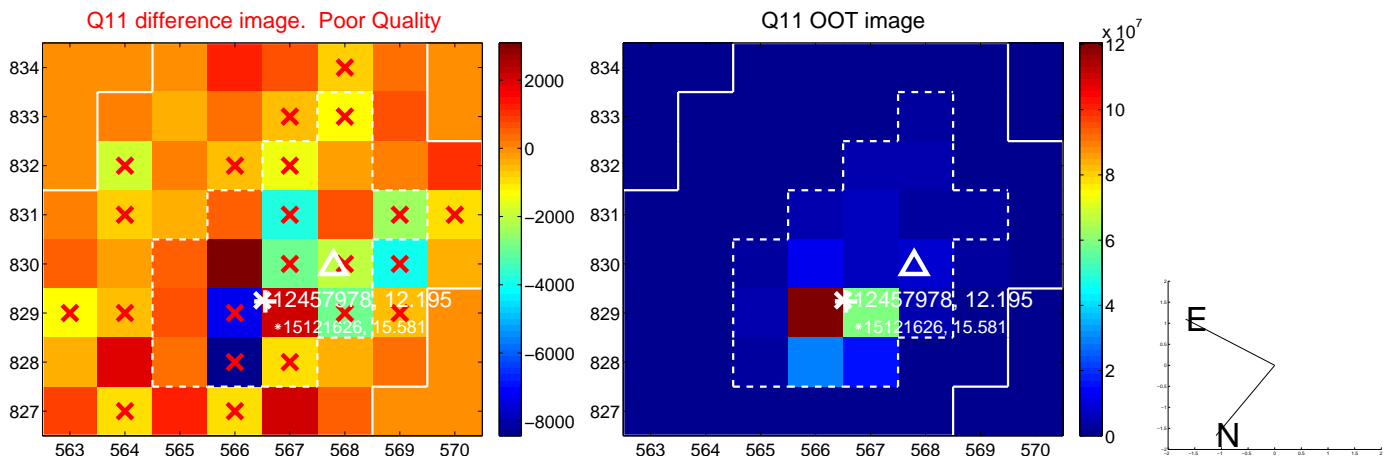
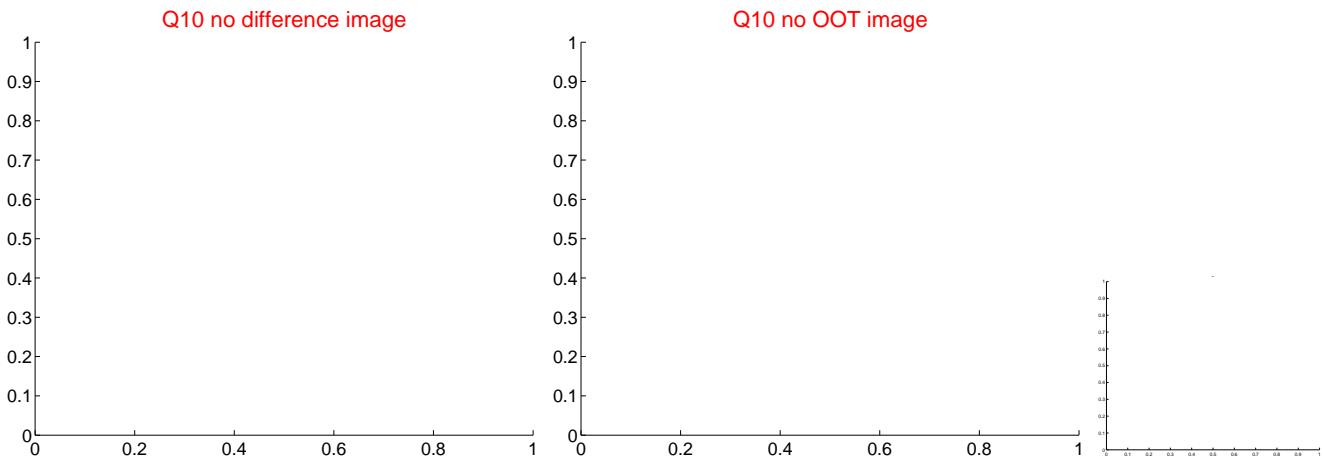
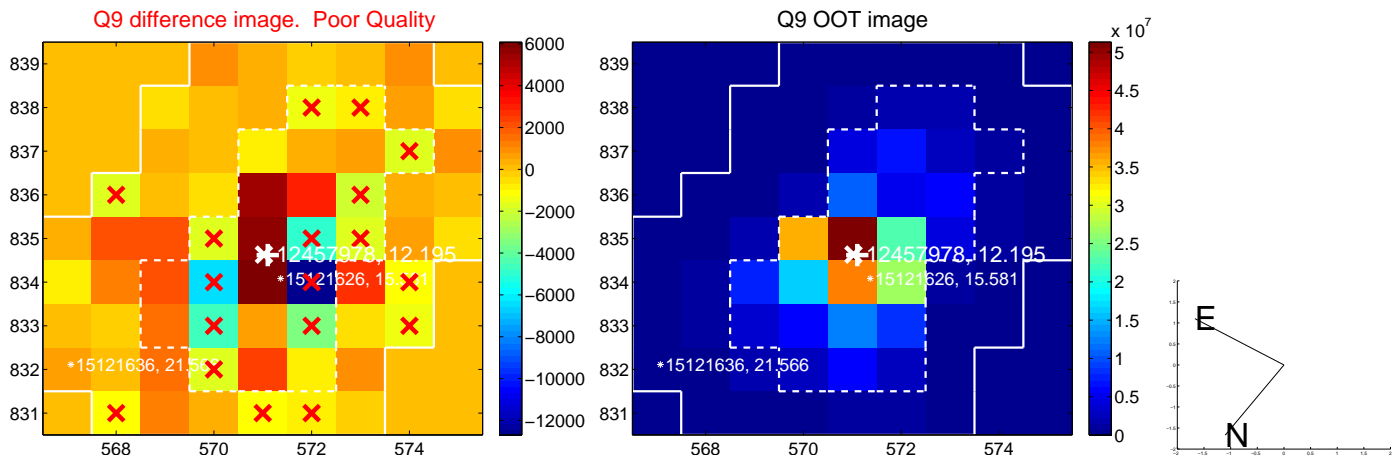
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



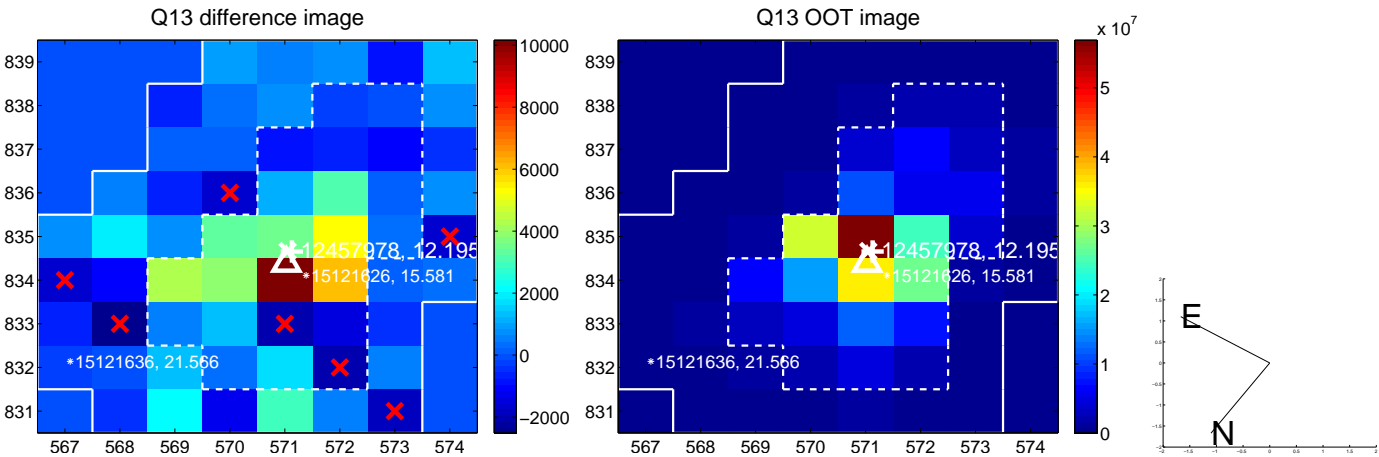
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



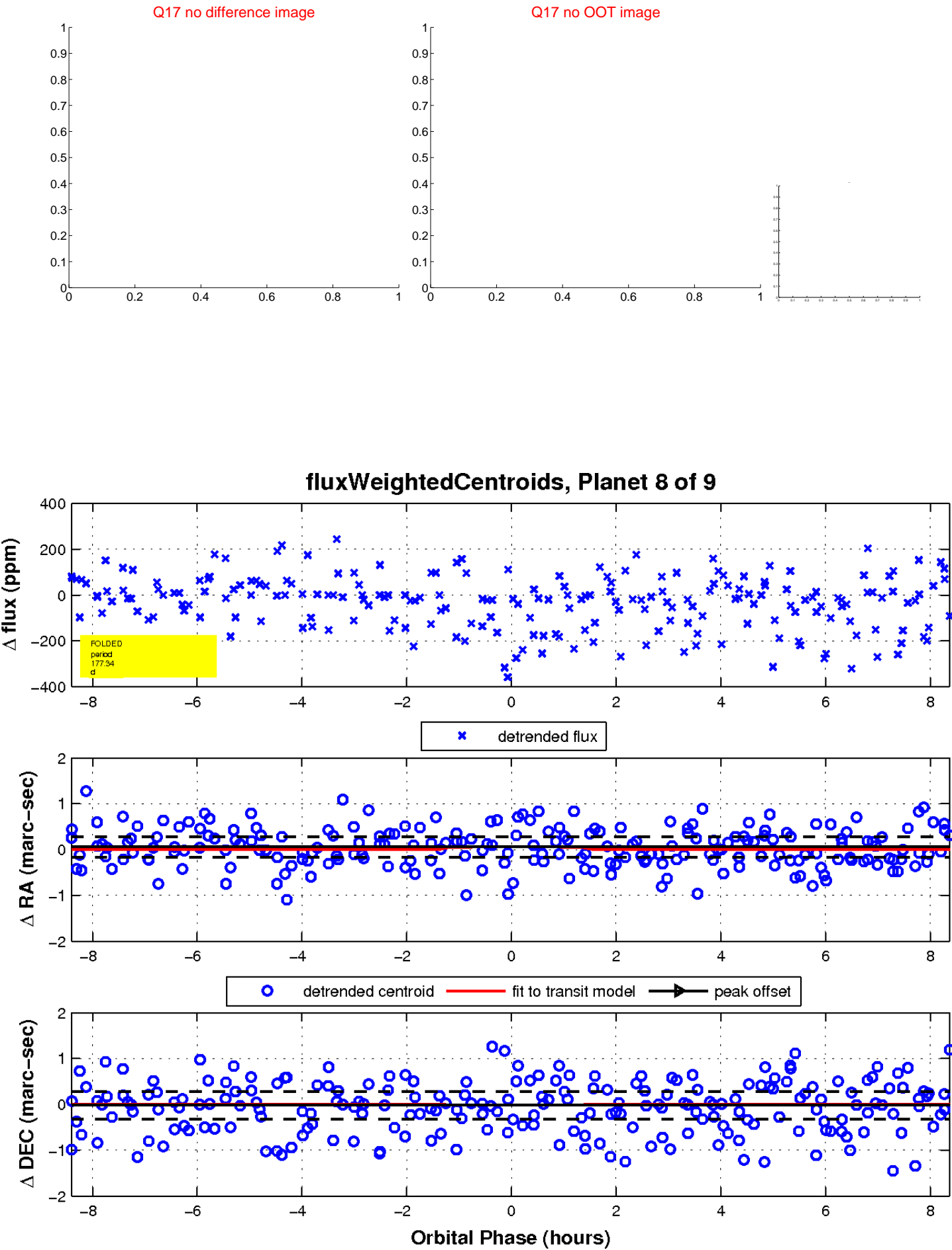
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

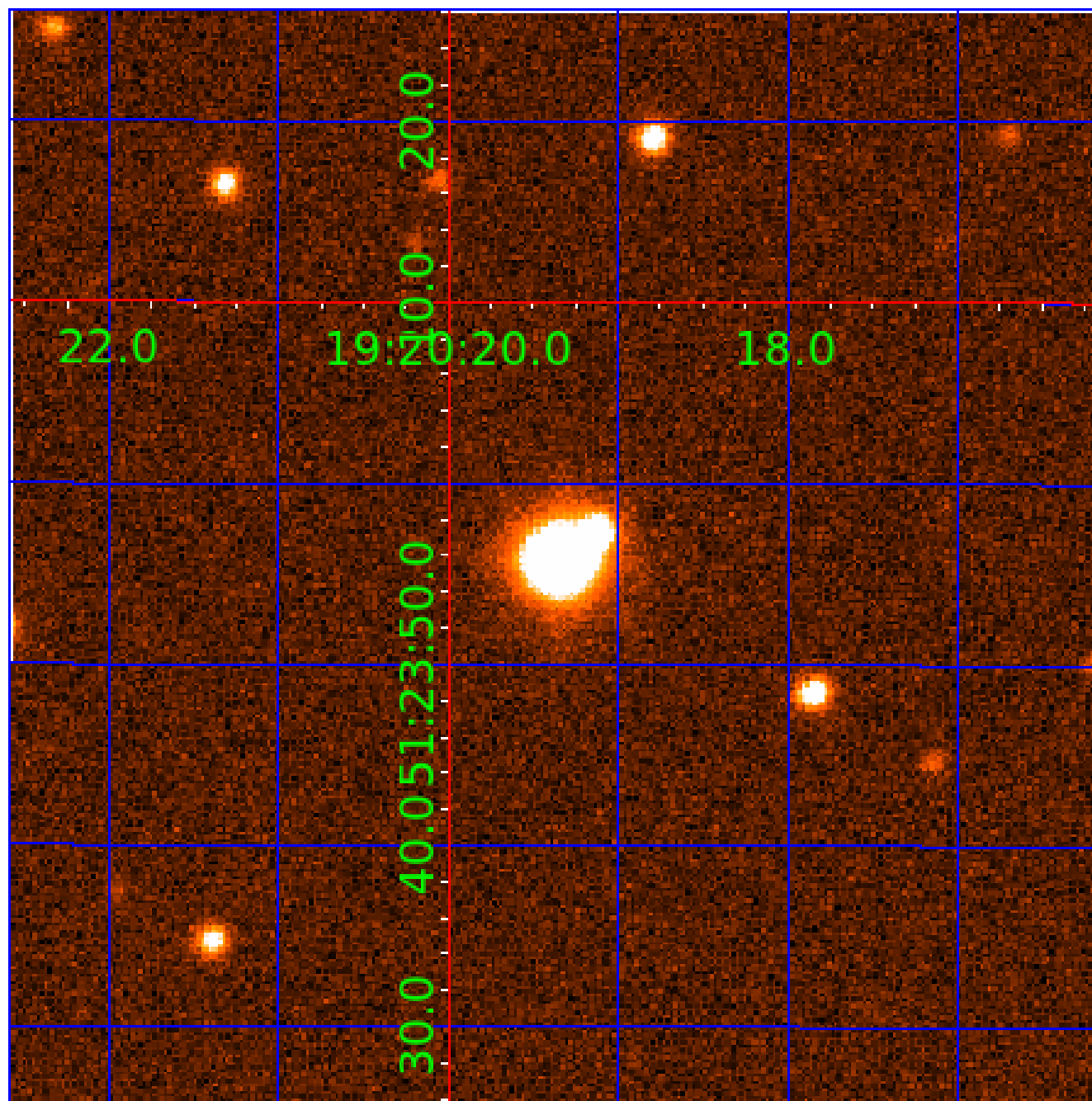


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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012457978-02	OBS	No	500.315843	327.189906	281.9	6.272	17.3	10.1	2.65	7042	4.54	7.14
012457978-03	OBS	No	65.533353	188.527270	156.1	20.725	12.4	6.1	2.65	7042	3.44	107.34
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012457978-08	OBS	No	177.344991	194.851549	203.0	2.809	7.9	7.6	2.65	7042	3.85	28.46
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012457978-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
012457978-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
012457978-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS— HALO_GHOST
012457978-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT
012457978-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
012457978-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
012457978-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV
012457978-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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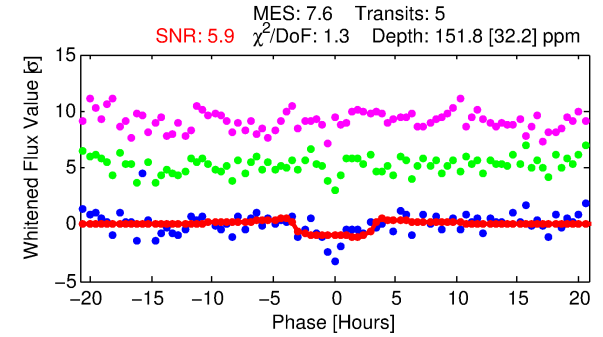
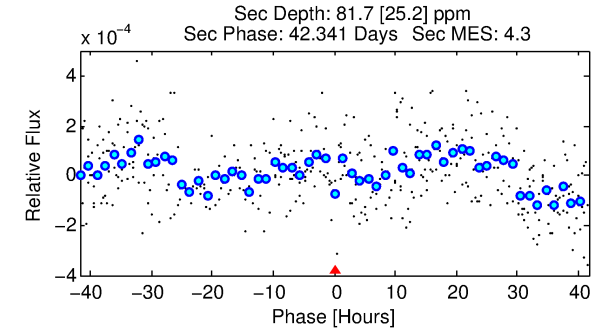
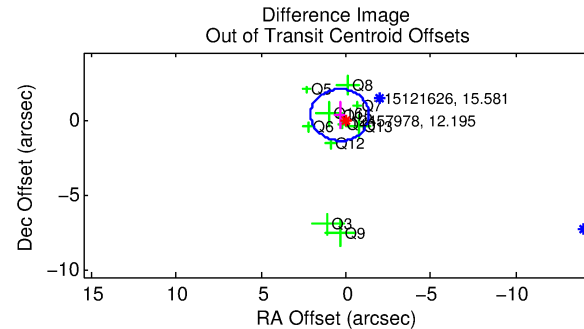
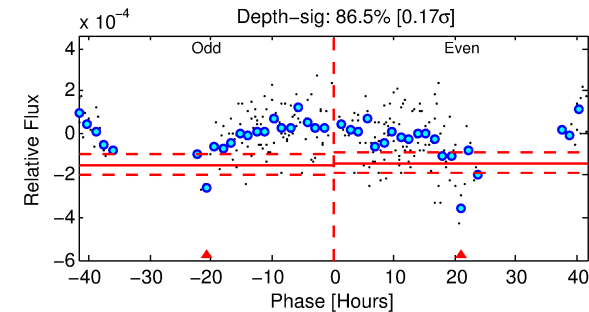
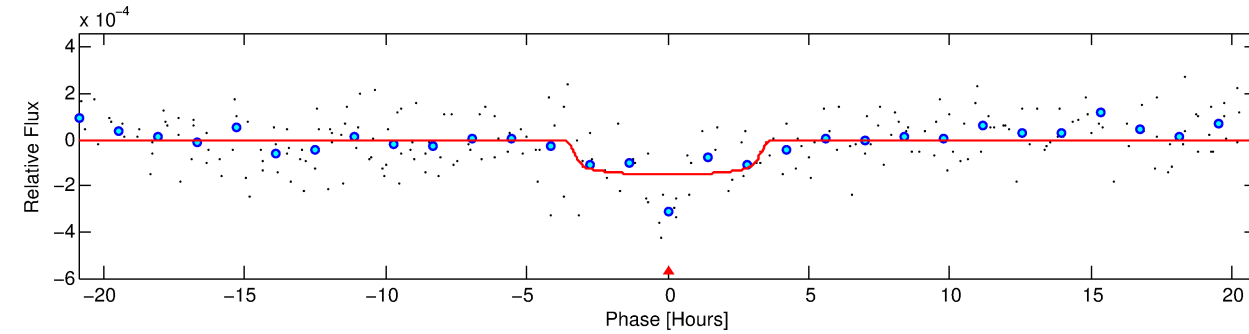
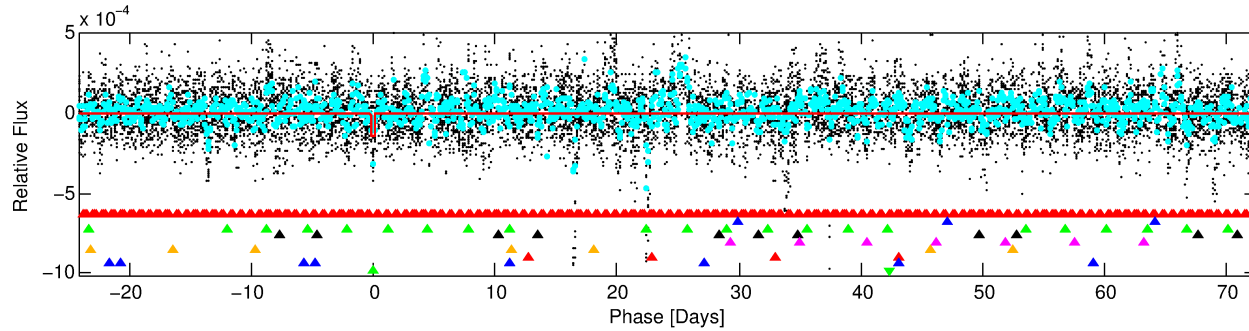
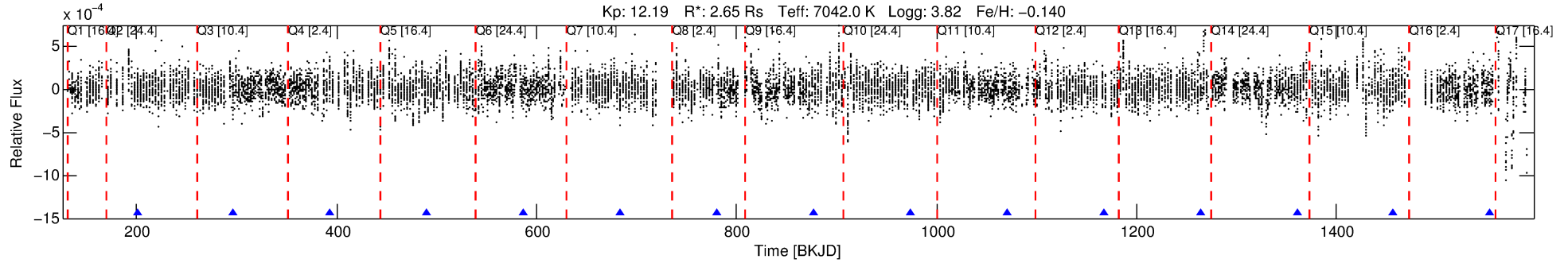
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012457978-09

No Significant Match Found

DV One-Page Summary

KIC: 12457978 Candidate: 9 of 9 Period: 96.645 d



DV Fit Results:

Period = 96.64509 [0.00220] d
Epoch = 200.5542 [0.0191] BKJD
Rp/R* = 0.0128 [0.0057]
a/R* = 56.81 [141.63]
b = 0.86 [0.76]
Seff = 63.95 [33.27]
Teff = 721 [94] K
Rp = 3.71 [2.13] Re
a = 0.4923 [0.1614] AU
Ag = 792.86 [844.67] [0.94σ]
Teffp = 5916 [1406] K [3.69σ]

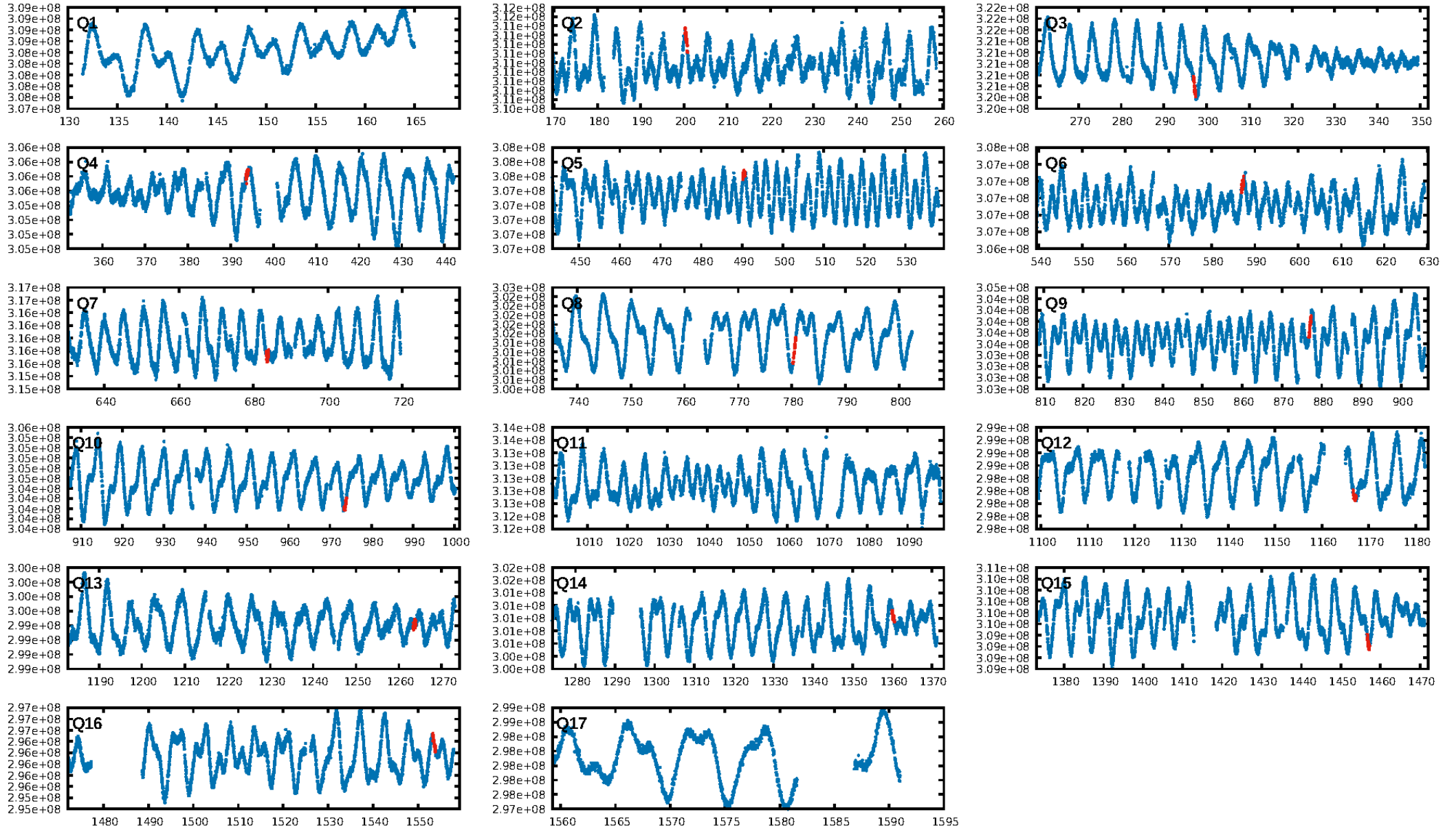
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [34.15σ]
LongPeriod-sig: 100.0% [65.91σ]
ModelChiSquare2-sig: 43.6%
ModelChiSquareGof-sig: 98.2%
Bootstrap-pfa: 2.06e-08
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.3904
Centroid-sig: 8.9%
Centroid-so: 1.509 arcsec [2.09σ]
OotOffset-rm: 0.490 arcsec [0.85σ]
KicOffset-rm: 0.302 arcsec [0.34σ]
OotOffset-st: 2/3/3/3 [11]
KicOffset-st: 2/3/3/3 [11]
DiffImageQuality-fgm: 0.45 [5/11]
DiffImageOverlap-fno: 0.46 [6/13]

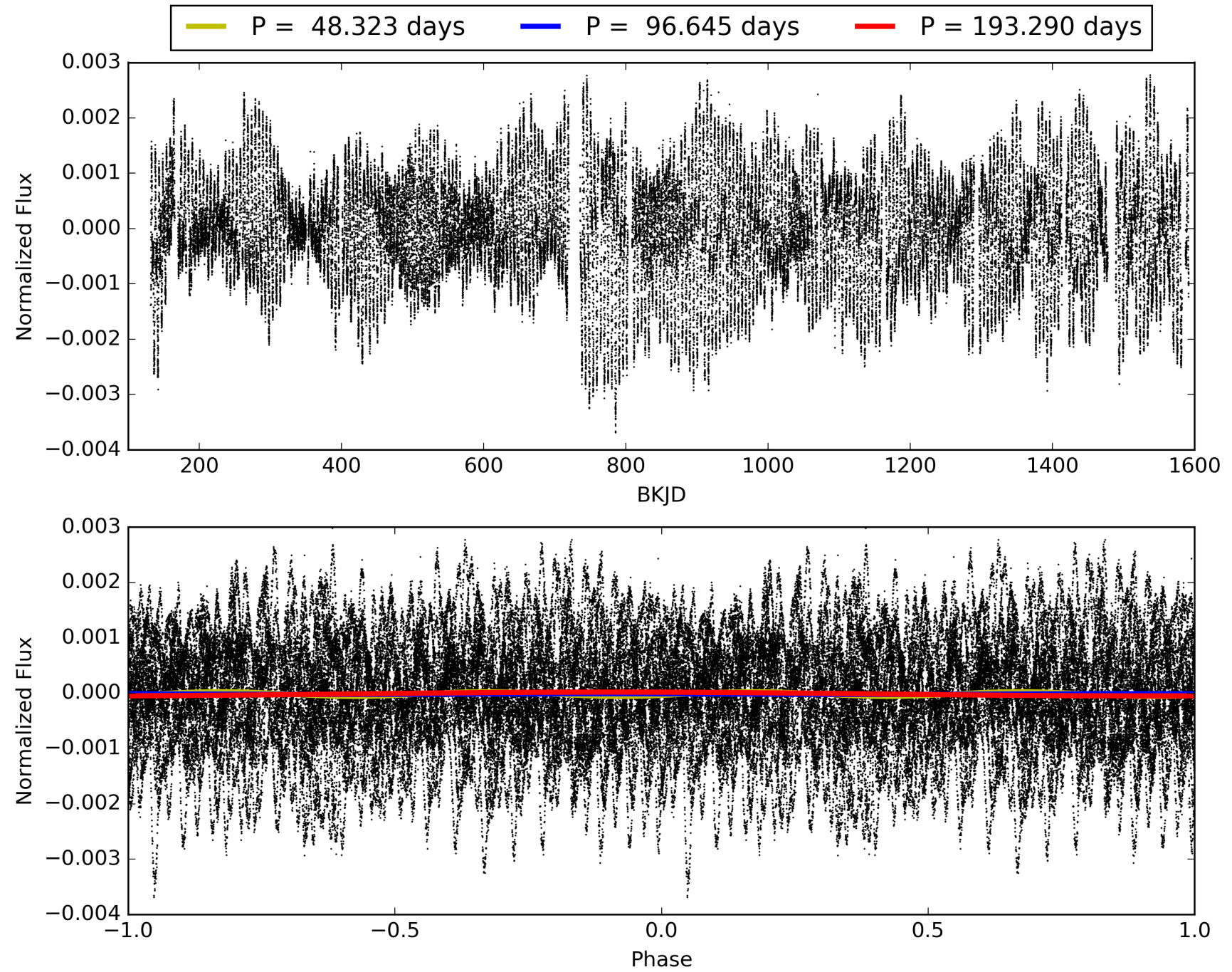
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:22:18 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012457978-09, PDC Light Curves

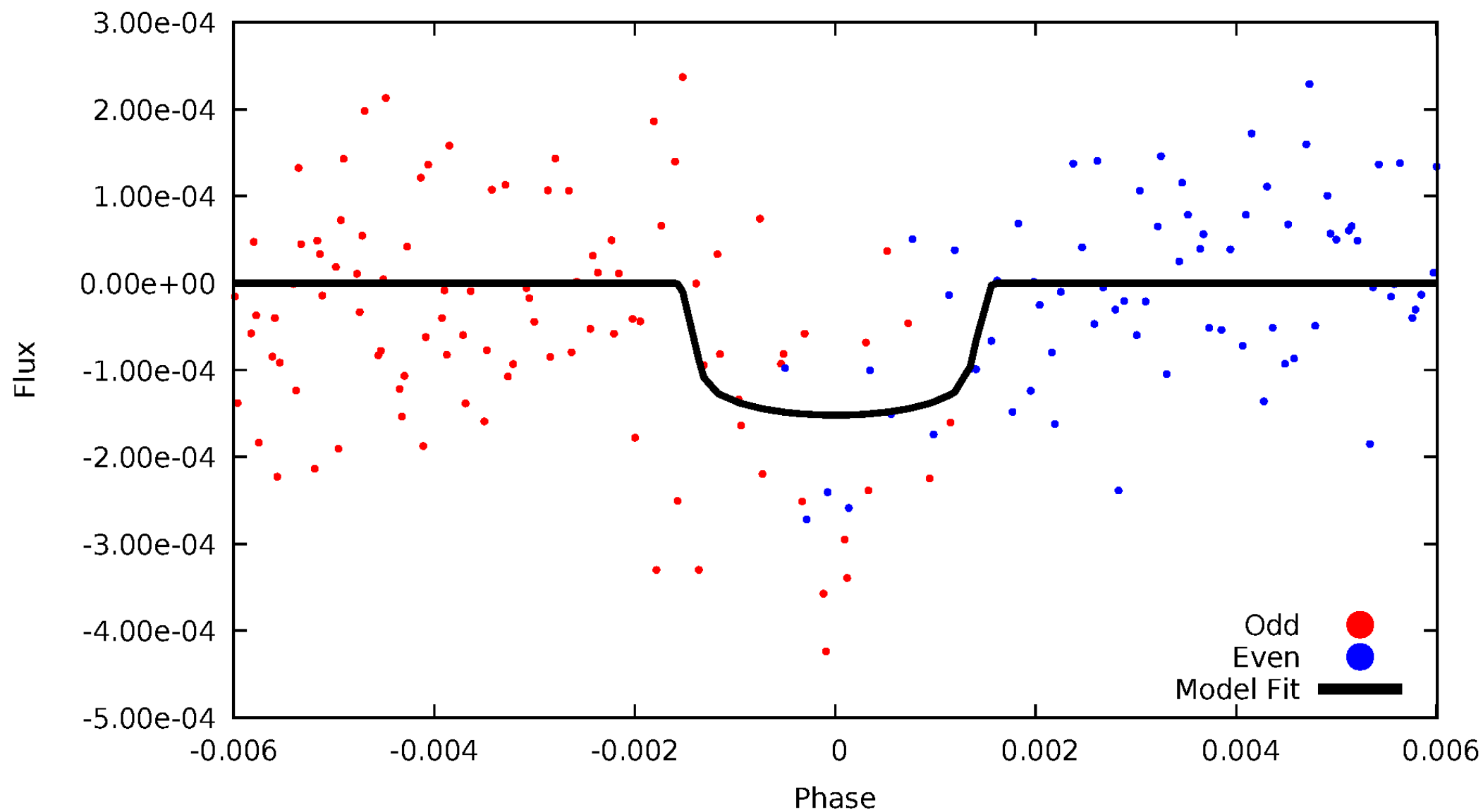


TCE 012457978-09



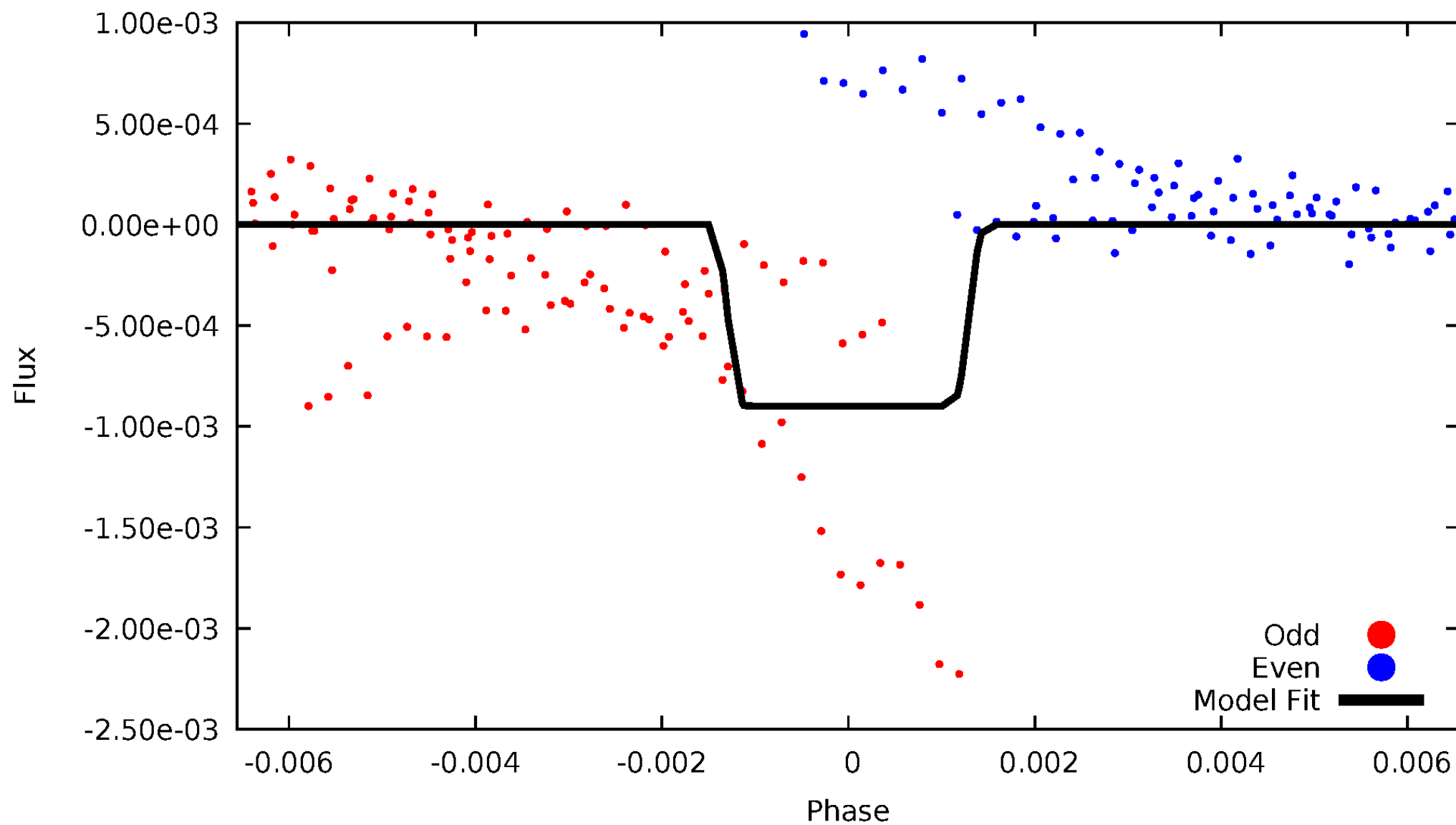
DV Odd/Even

TCE 012457978-09

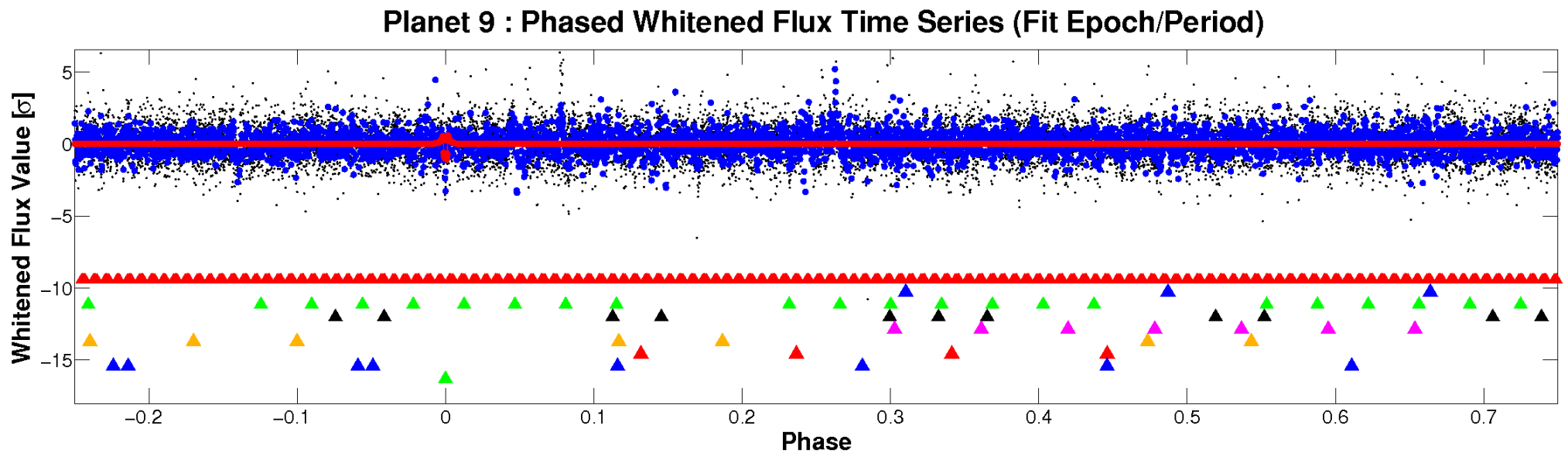
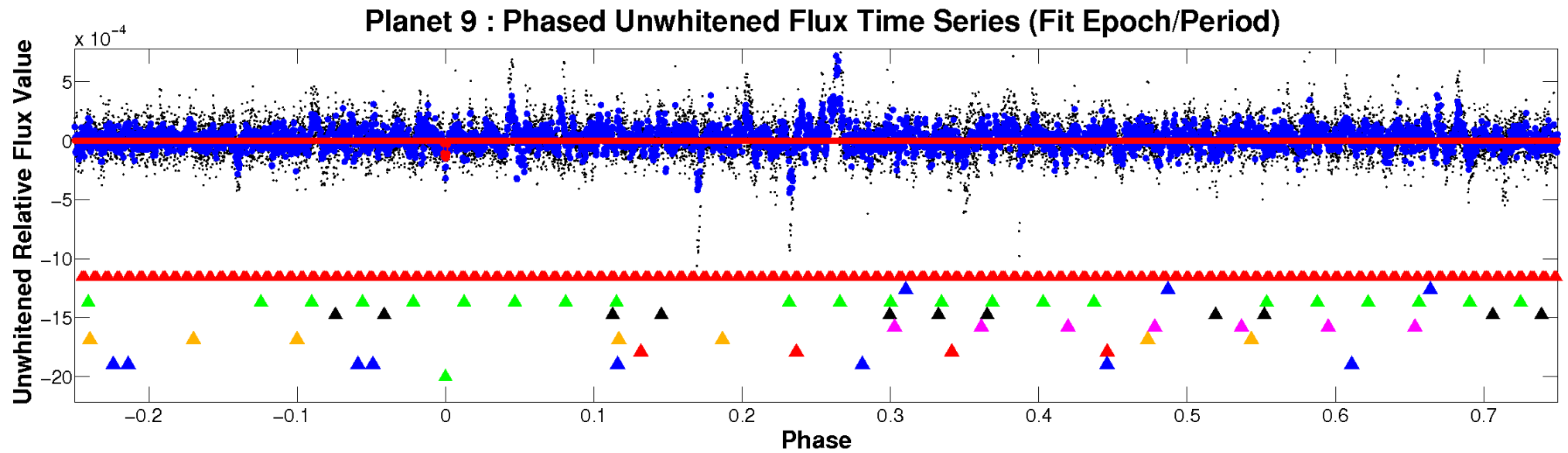


ALT Odd/Even

TCE 012457978-09

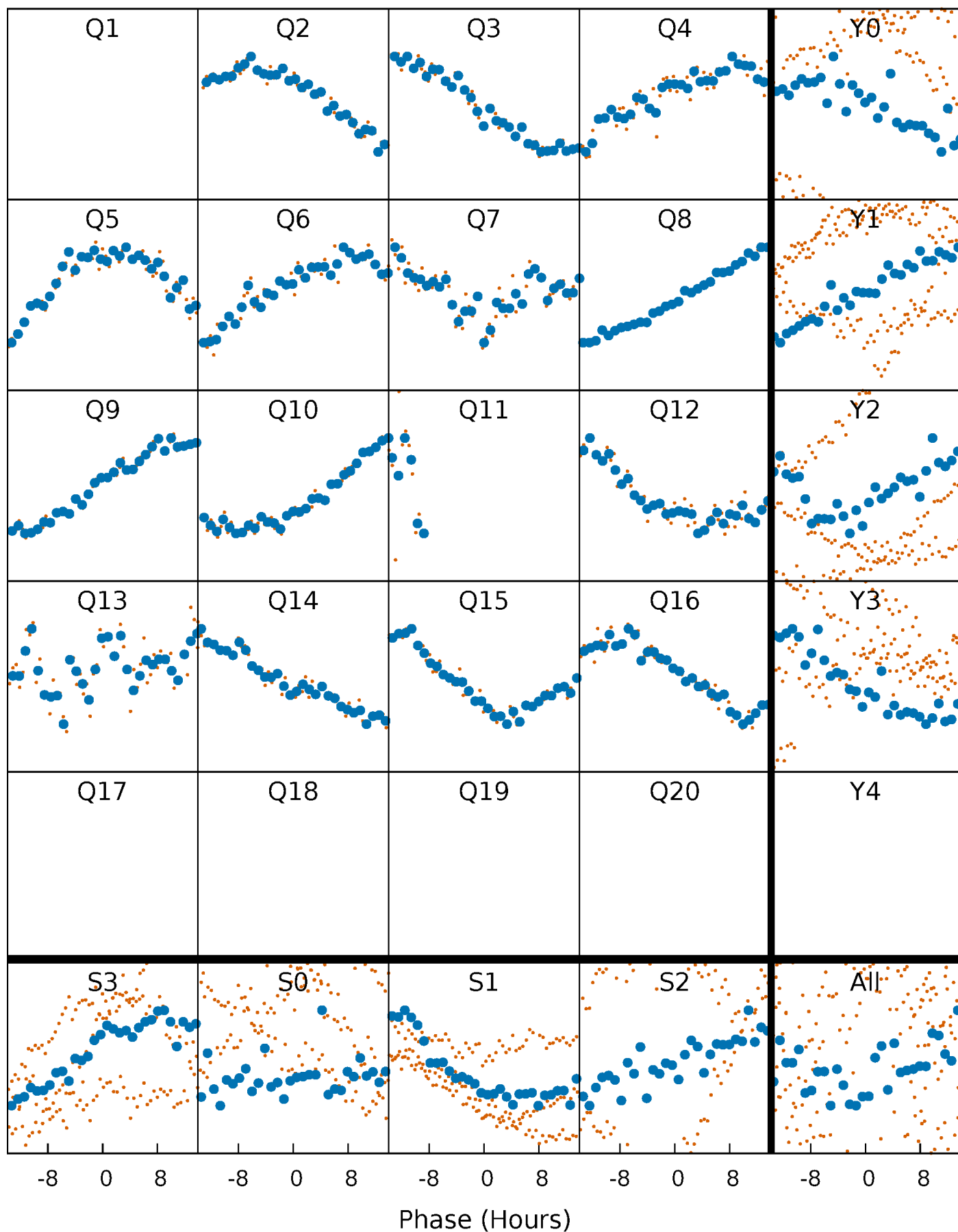


Non-Whitened Vs. Whitened Light Curve



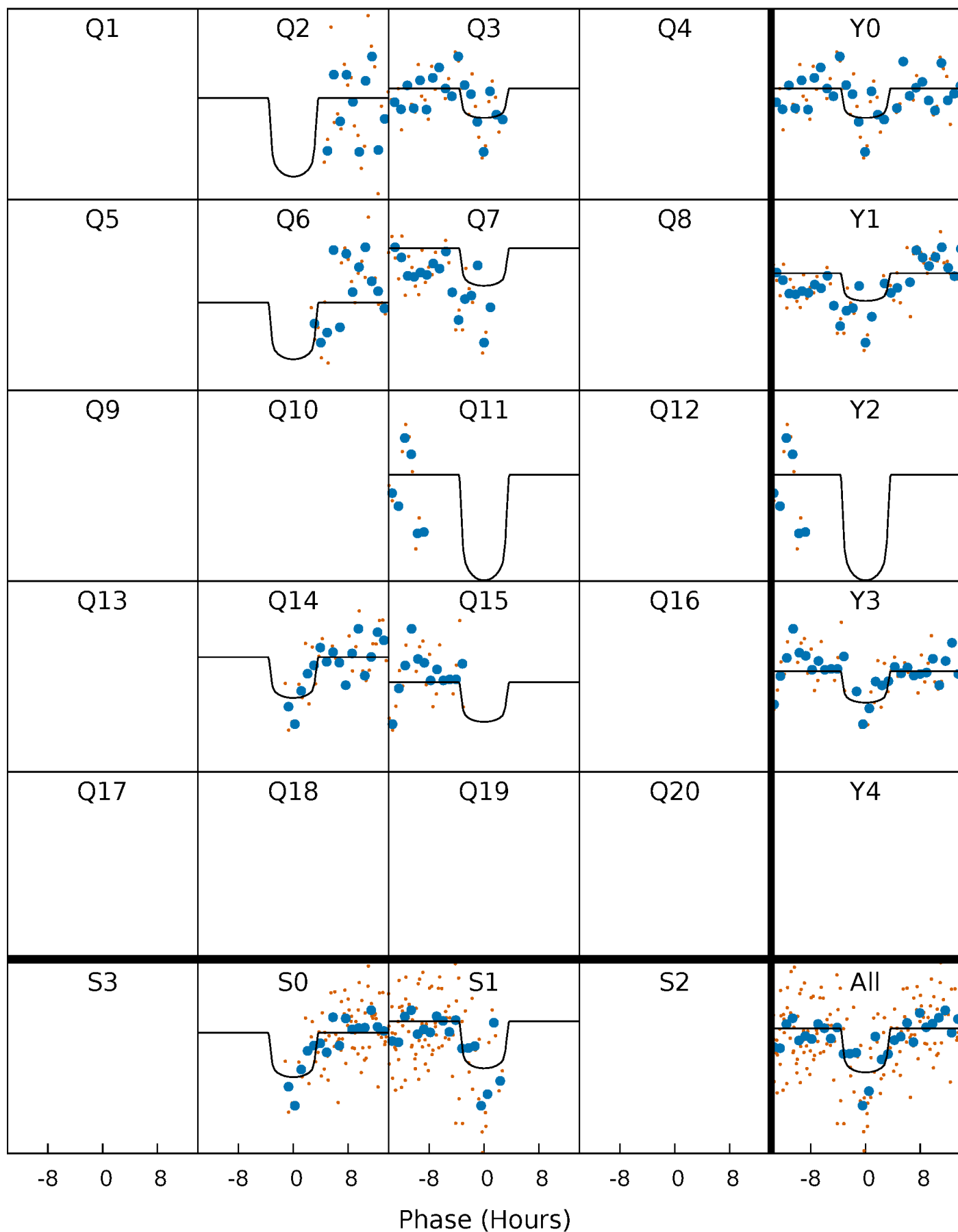
PDC Quarter-Phased Transit Curves

TCE 012457978-09 P= 96.645094 Days $T_0=200.554156$ (BKJD)



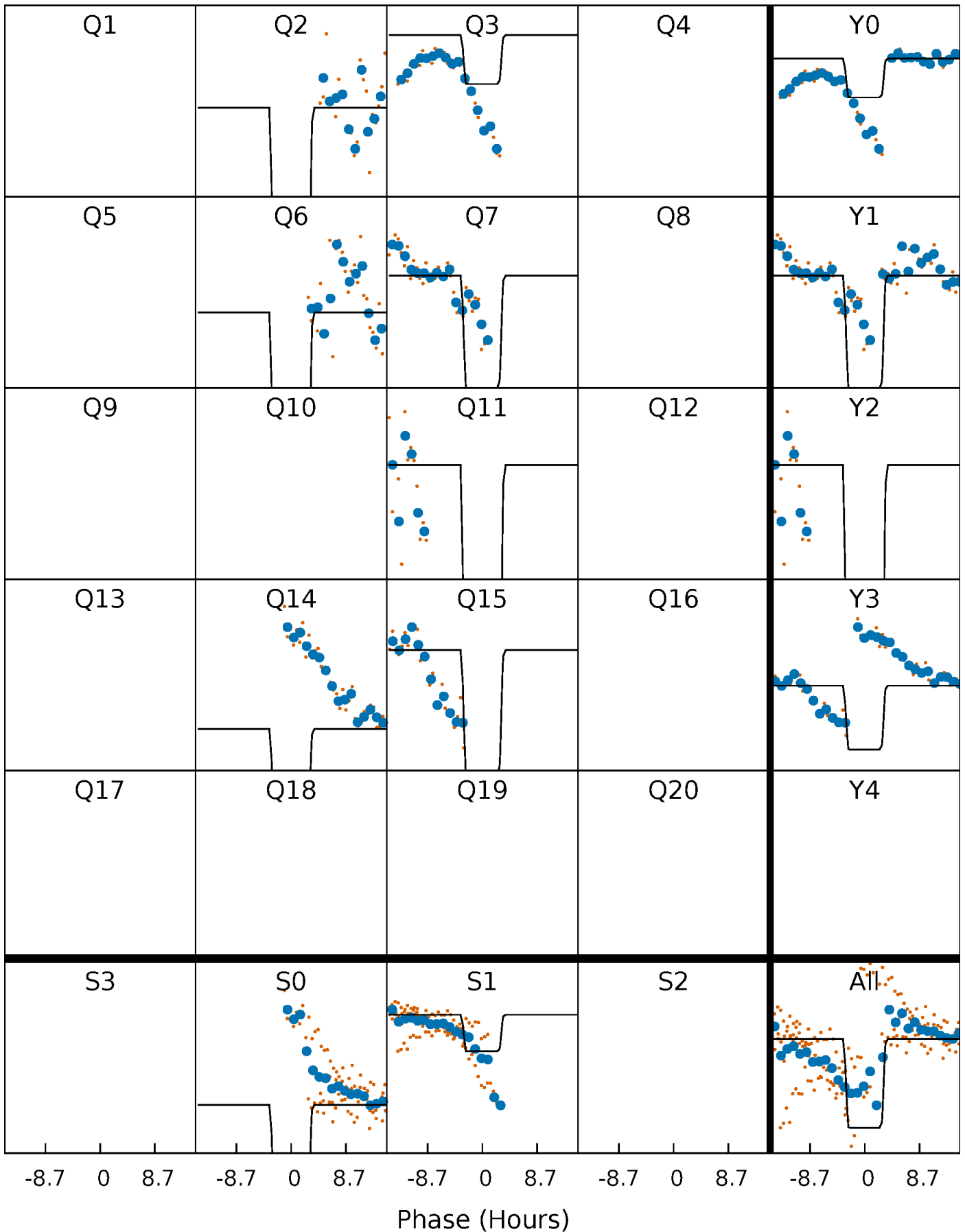
DV Quarter-Phased Transit Curves

TCE 012457978-09 P= 96.645094 Days $T_0=200.554156$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

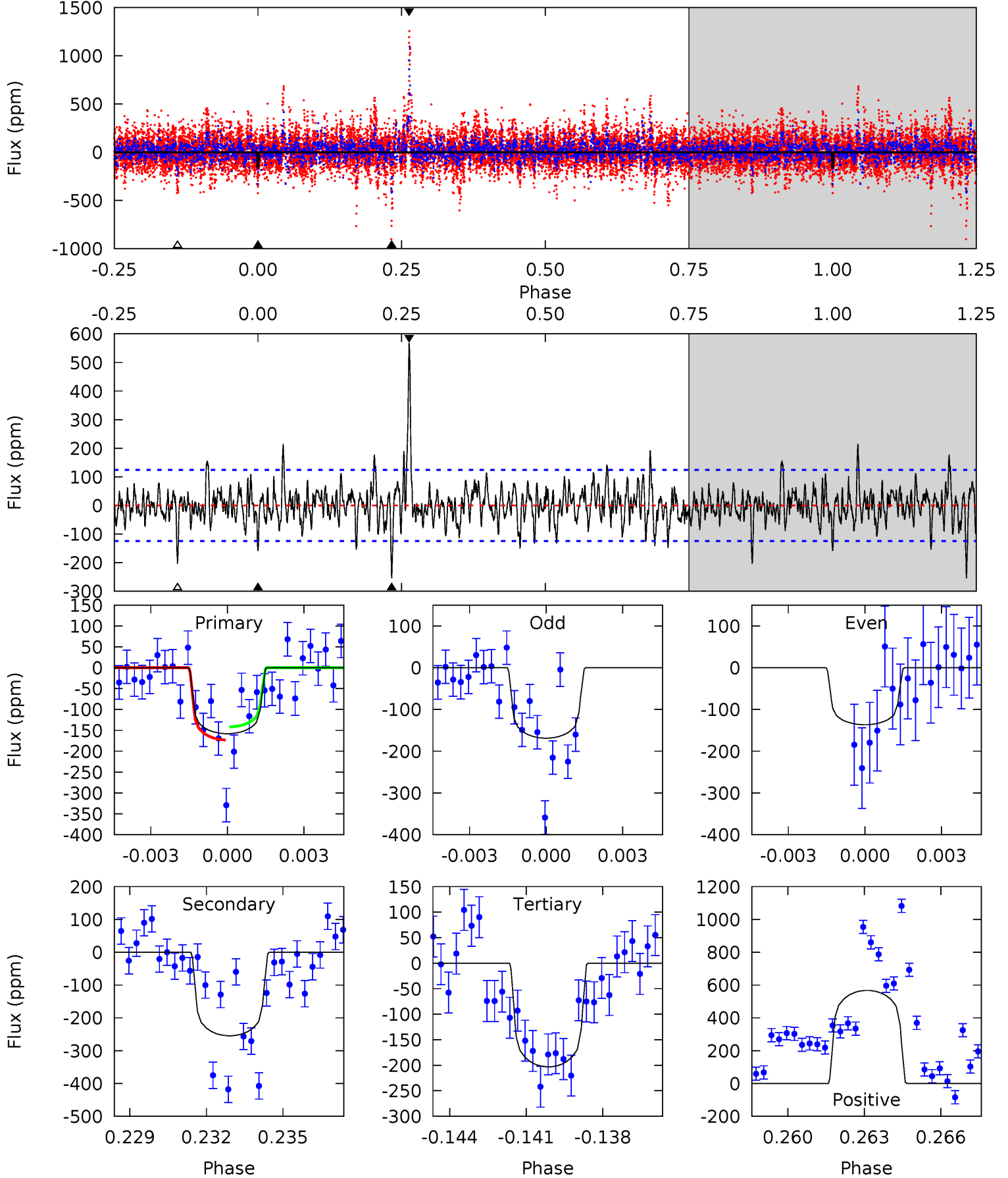
TCE 012457978-09 $P = 96.645220$ Days $T_0 = 200.550379$ (BKJD)



DV Model-Shift Uniqueness Test

012457978-09, P = 96.645094 Days, E = 103.909062 Days

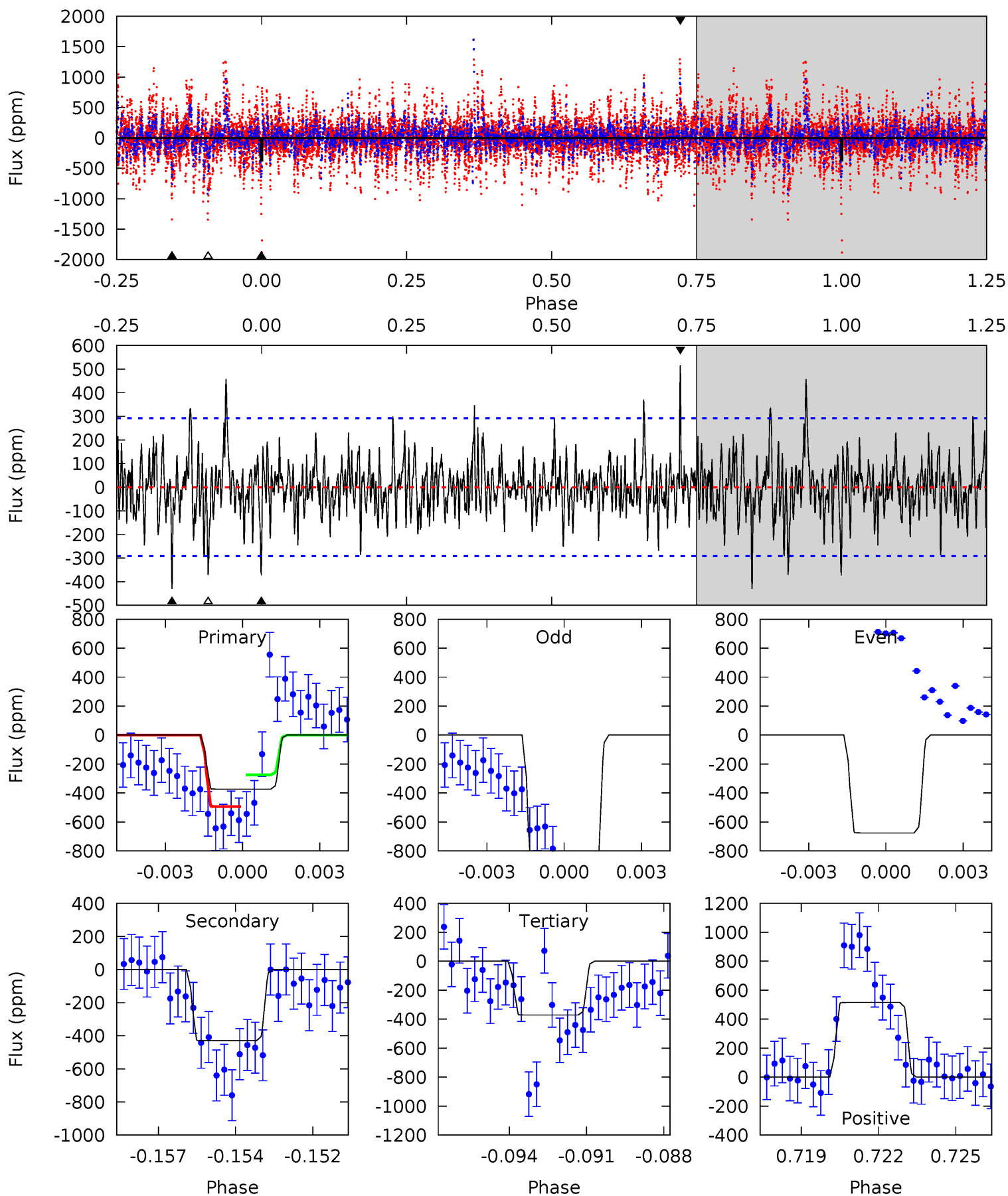
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.66	10.7	8.55	23.9	5.24	2.95	2.44	-1.90	-17.2	2.17	-13.2	0.62	1.03	0.69	0.66



Alt Model-Shift Uniqueness Test

012457978-09, P = 96.645220 Days, E = 103.905159 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.74	7.77	6.70	9.30	5.27	2.99	1.67	0.04	-2.56	1.07	-1.54	4.58	1.99	0.54	2.08



Stellar Parameters For KIC 012457978

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7042^{+172}_{-246}	$3.822^{+0.285}_{-0.095}$	$-0.140^{+0.300}_{-0.300}$	$2.652^{+0.417}_{-0.972}$	$1.701^{+0.156}_{-0.365}$	$0.128^{+0.252}_{-0.039}$
	+2%/-3%	+7%/-2%	+214%/-214%	+16%/-37%	+9%/-21%	+196%/-30%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012457978-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-255 ± 24	$3.44^{+1.62}_{-1.49}$	990^{+60}_{-87}	7973^{+3624}_{-1477}	2748^{+5734}_{-1480}
Alt.	-430 ± 55	$8.32^{+1.98}_{-2.21}$	985^{+61}_{-84}	5798^{+736}_{-506}	836^{+663}_{-297}

T_{max} = Theoretical Maximum Planetary Temperature
 T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)
 A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

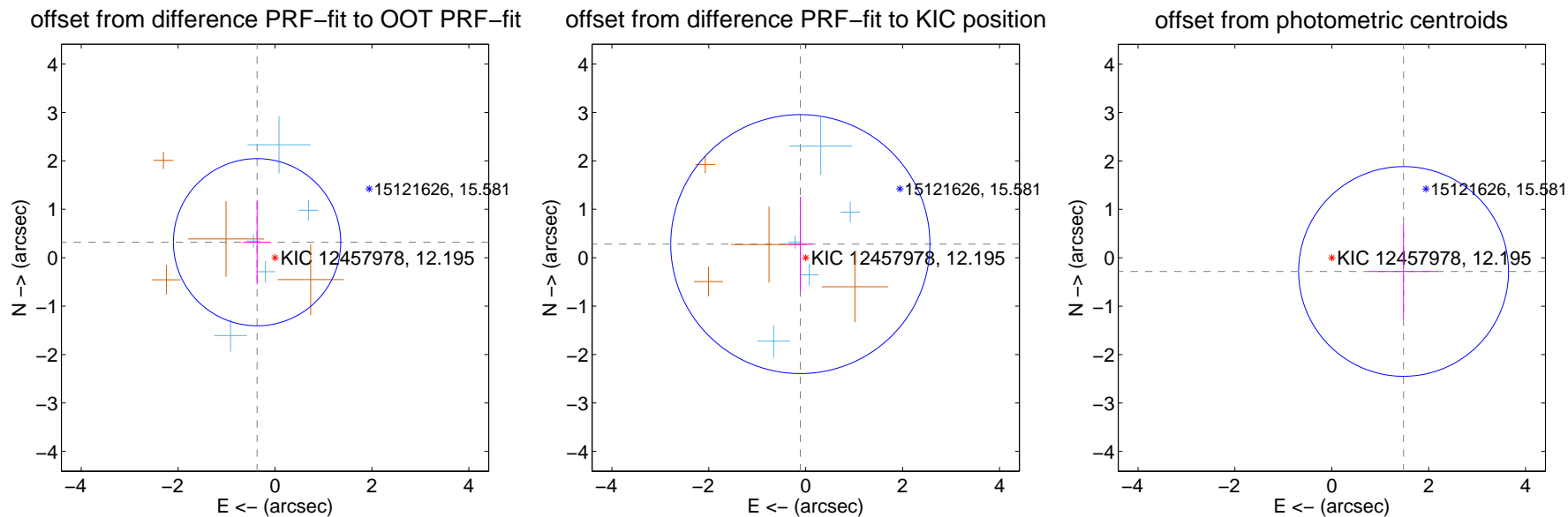
DV Centroid Data

Supplemental centroid analysis for 012457978-09. Kepler magnitude: 12.20. Transit SNR 5.87

There are 5 quarters with good PRF difference image offsets

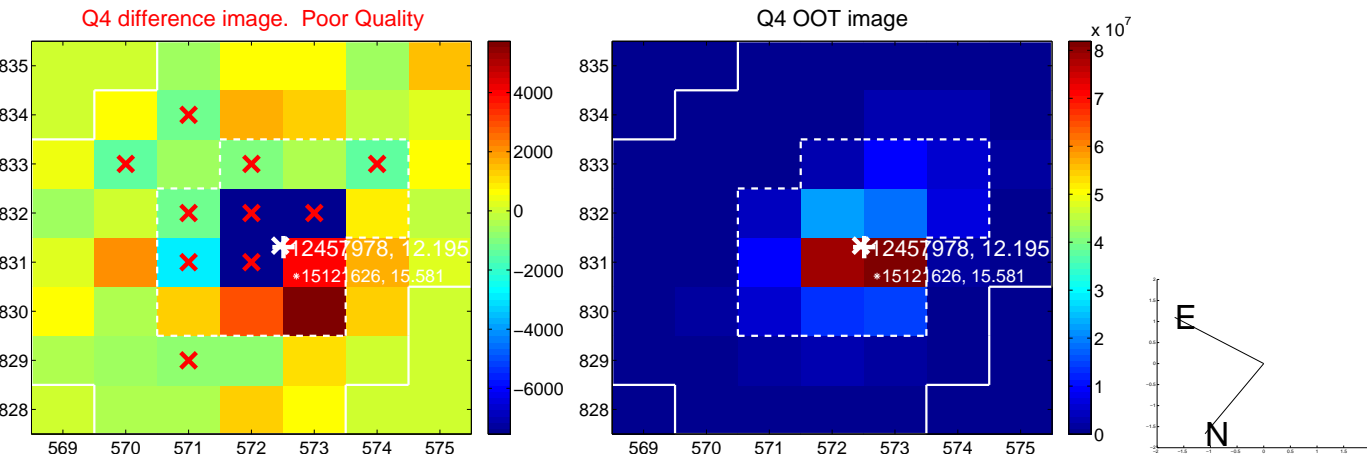
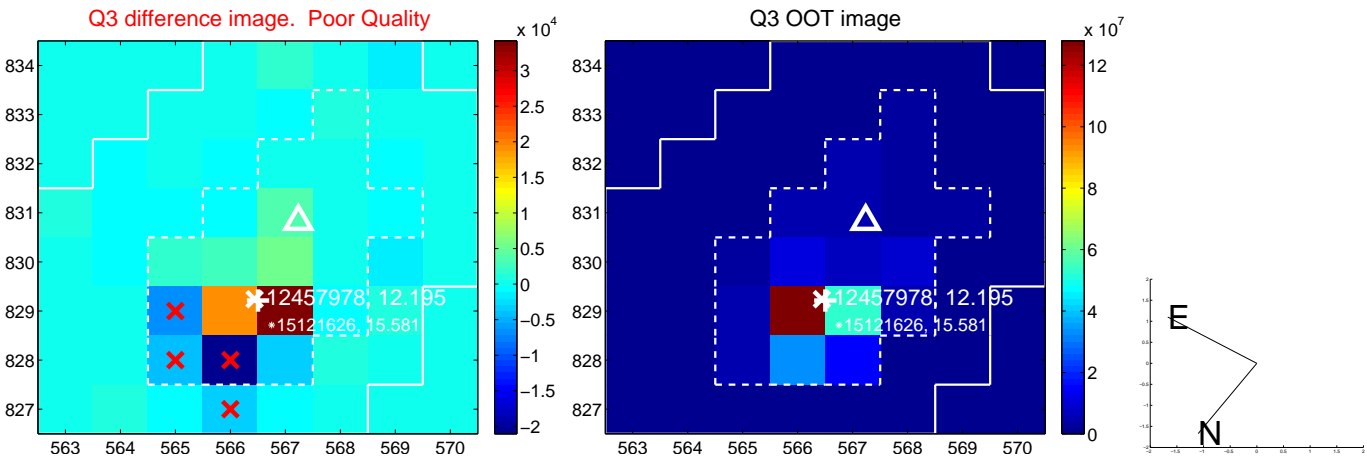
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.490 ± 0.576	0.85	0.371 ± 0.283	0.320 ± 0.871
PRF-fit source offset from KIC position	0.302 ± 0.892	0.34	0.111 ± 0.260	0.281 ± 0.978
photometric centroid source offset	1.51 ± 0.72	2.09	-1.48 ± 0.71	-0.28 ± 0.99

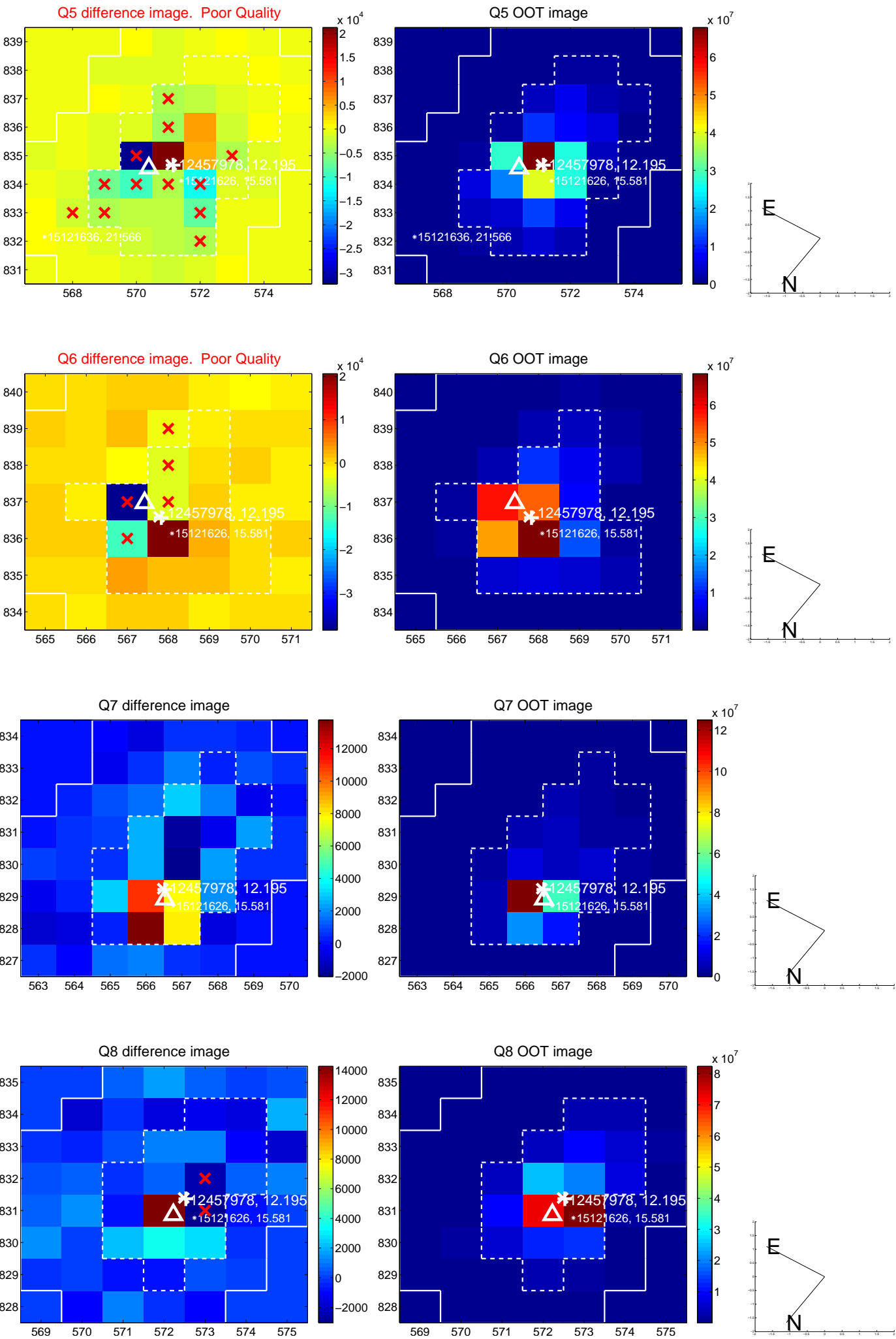


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

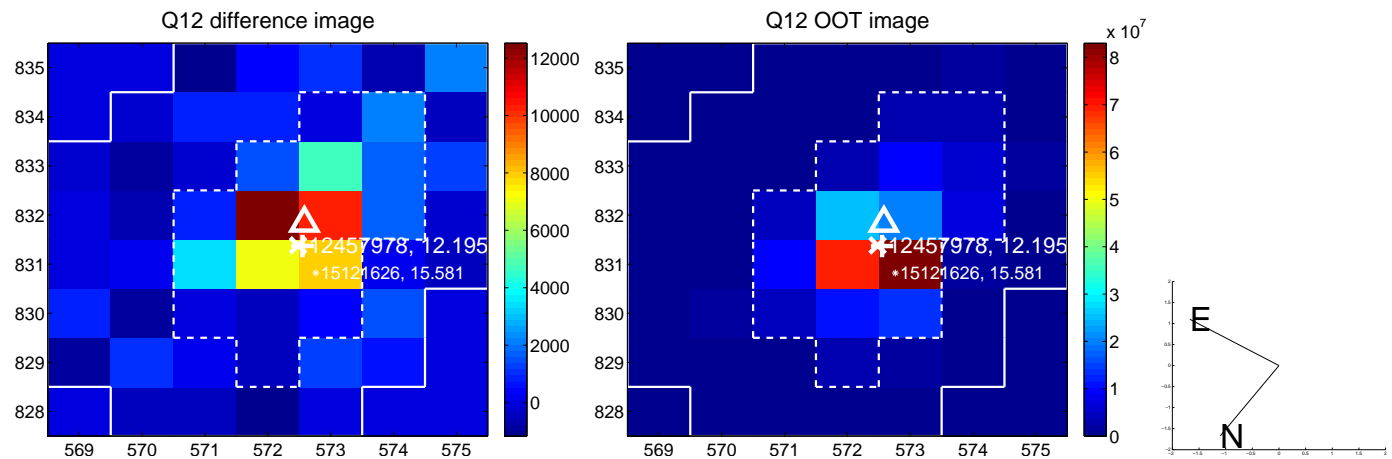
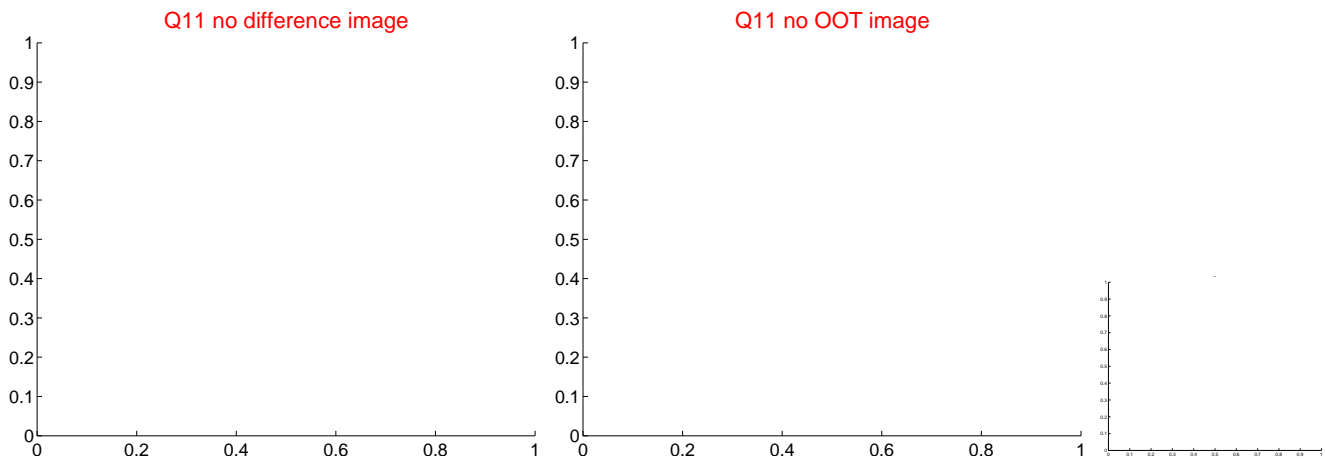
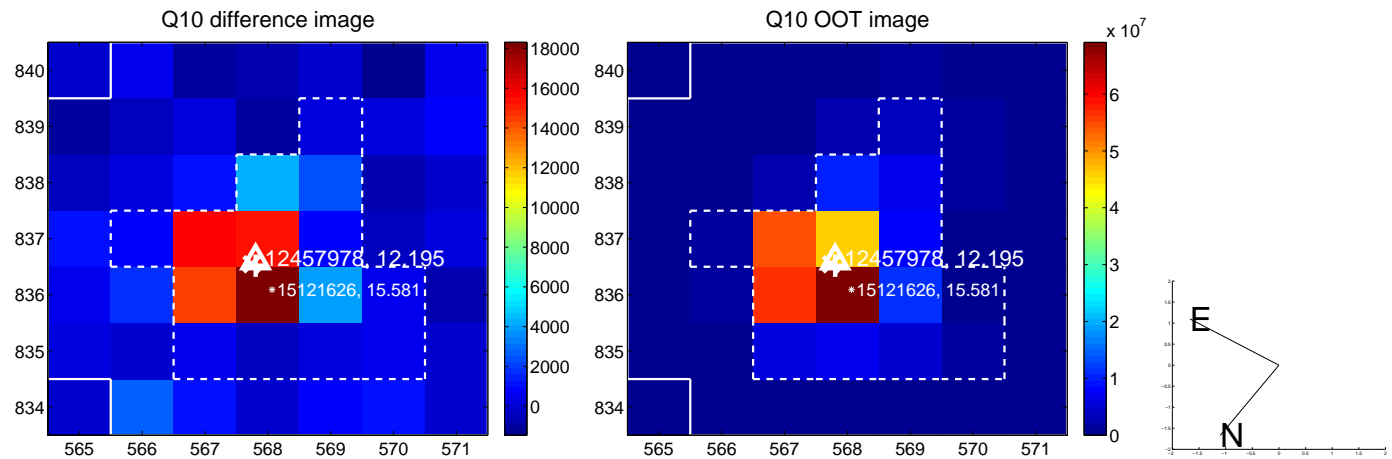
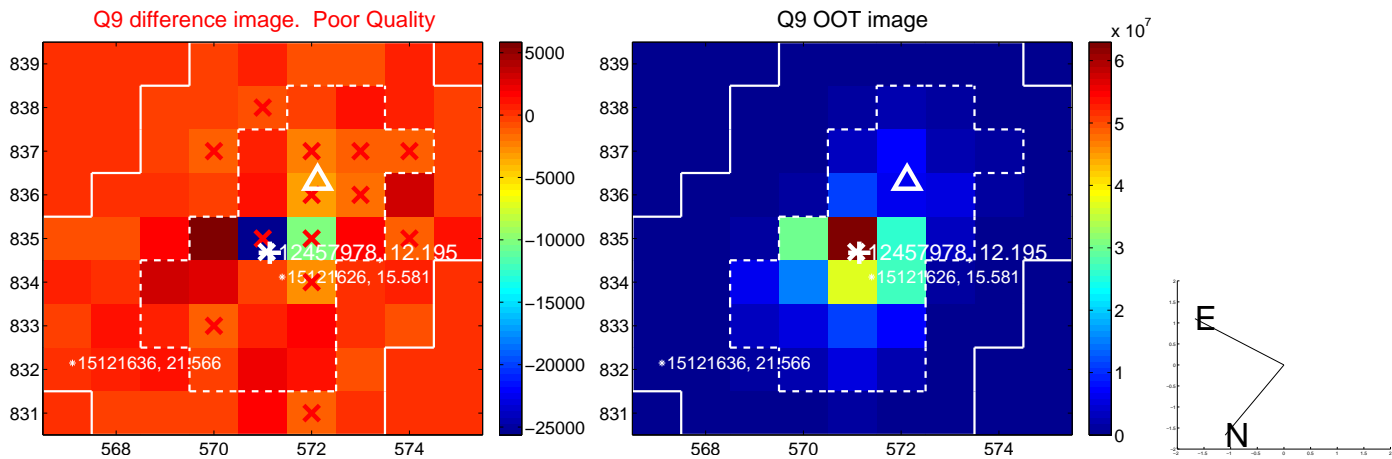
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



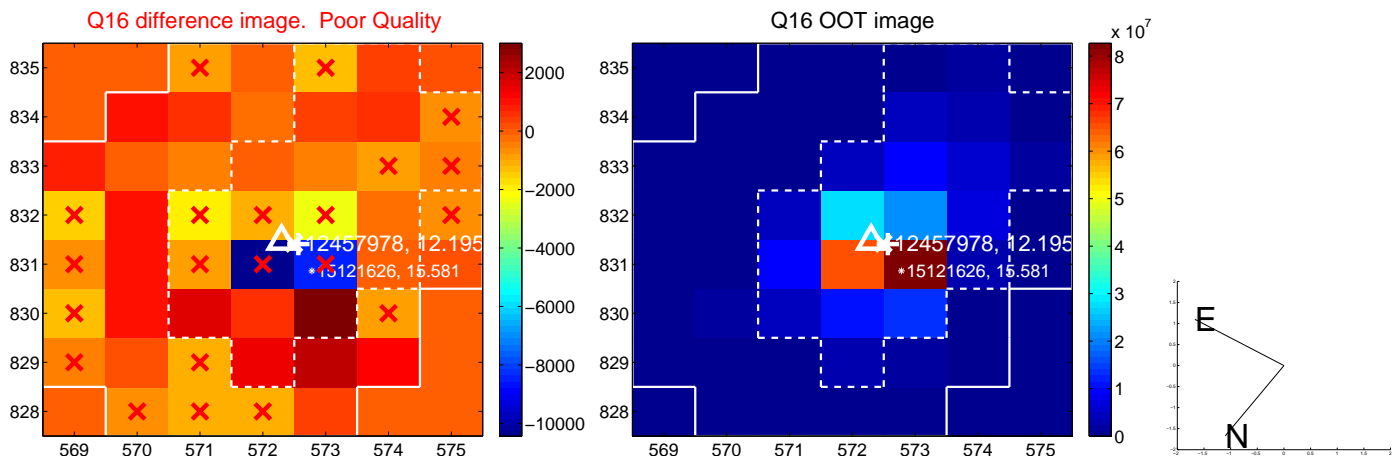
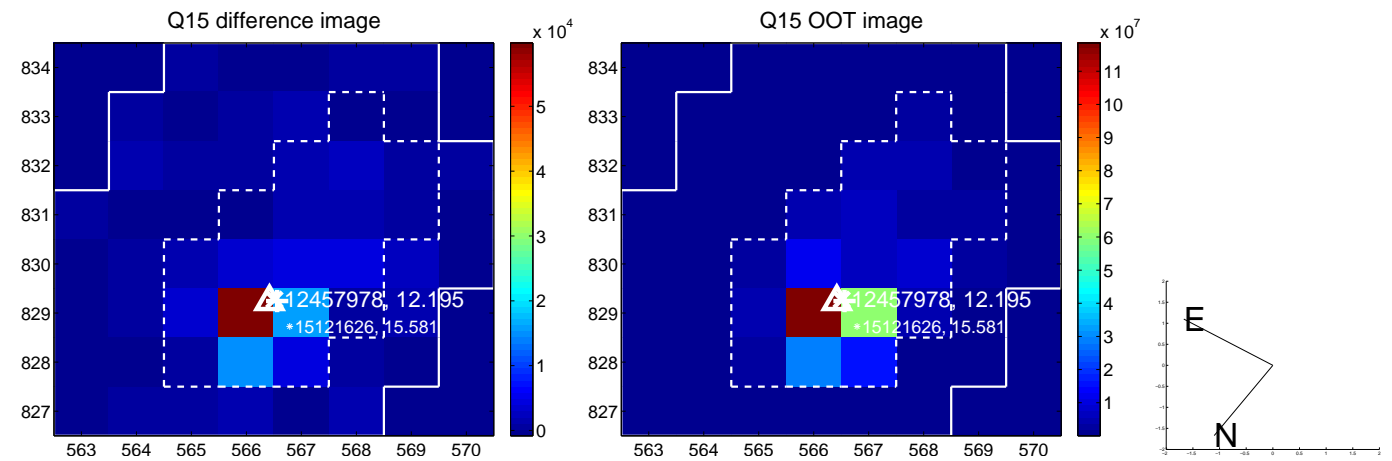
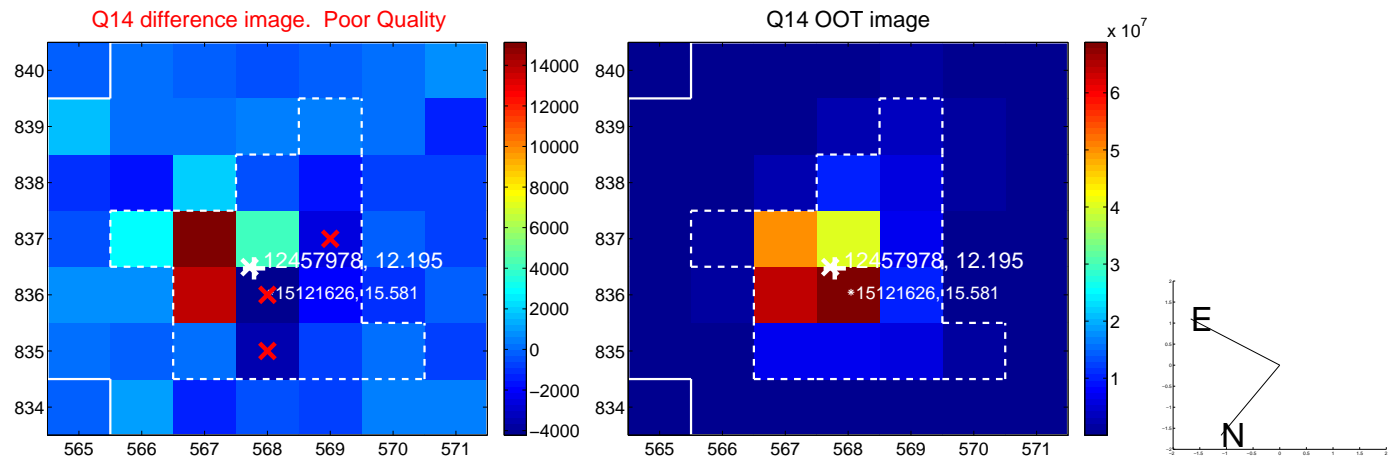
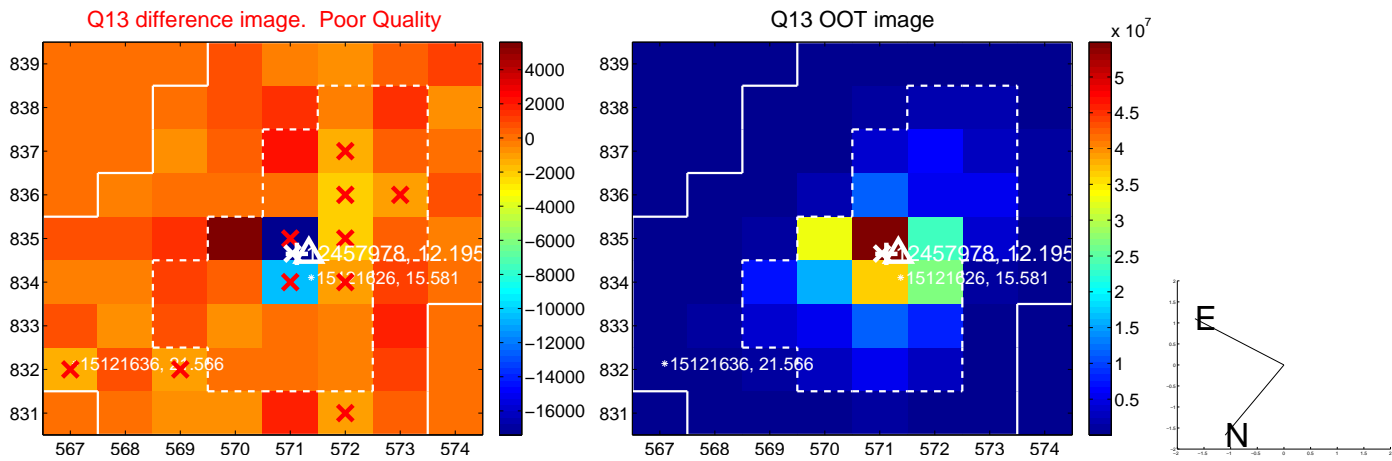
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



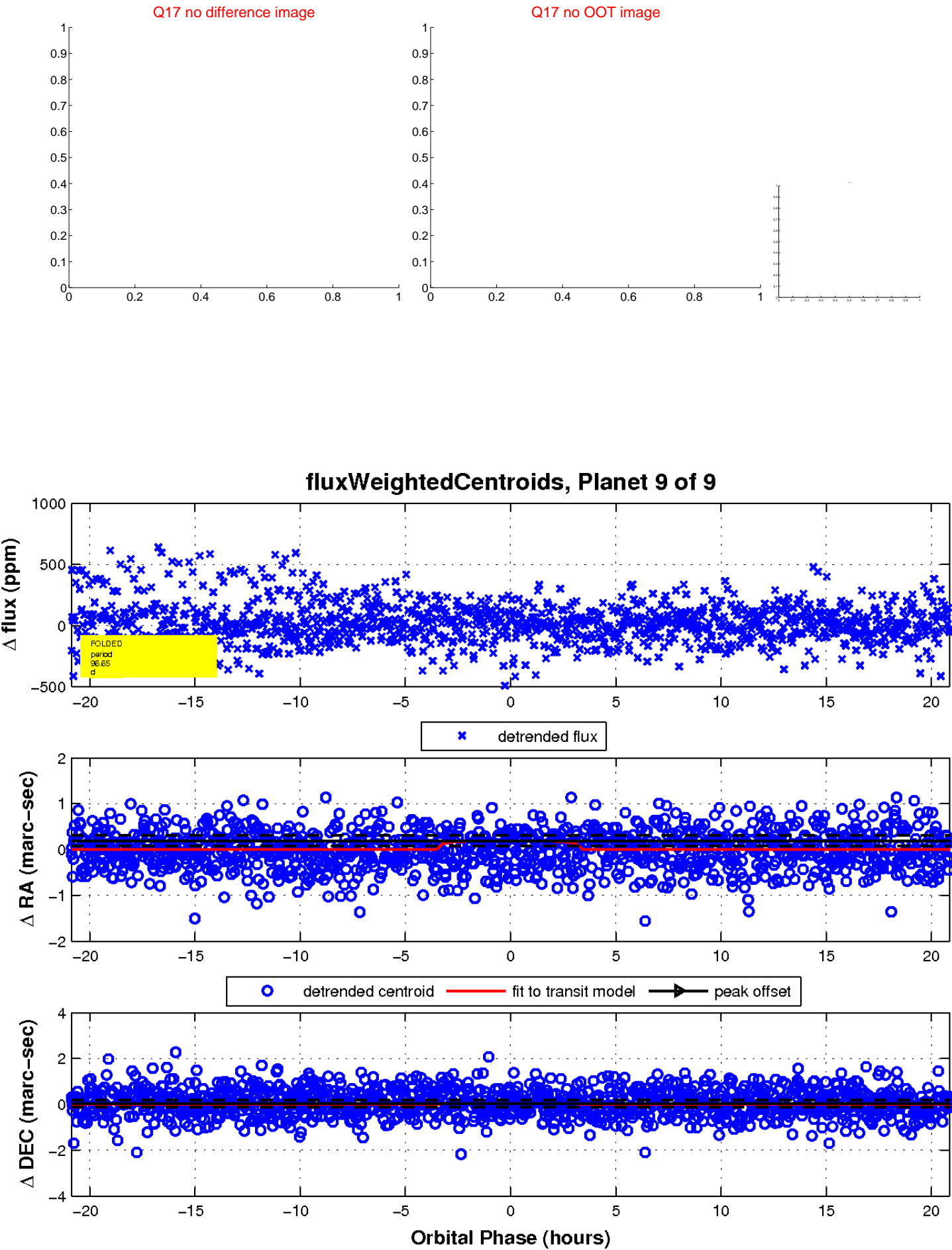
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

